TP-LINK®

User Guide



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FCC STATEMENT



This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to pro-vide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not in-stalled and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1) This device may not cause harmful interference.
2) This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CE Mark Warning



This is a class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

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Package Contents

The follow items should be found in your package:

- TL-SC3130 2-Way Audio Surveillance Camera
- Power Adapter
- Mounting Bracket with three screws, a Lock Ring, a Brace and a Base Plate
- RJ45 Cable
- Quick Installation Guide
- Resource CD, including:
  - This User Guide
  - Other helpful information

Note:

Make sure that the package contains the above items. If any of the listed items are damaged or missing, please contact your distributor.

Chapter 1 Minimum System Requirements

We strongly recommend your computers follow our minimum requirements in order to use this IP-Camera normally. If your computer doesn't meet these requirements below, it might cause some problems.

Item	Requirements
CPU	Pentium 4 1600MHz (or equivalent AMD)
Graphic Card	64 MB RAM graphic cards(or equivalent on-board graphic cards)
RAM	512 MB
Operating System	Windows 98, Windows ME (Please see☞ **Note**) Windows2000, 2003, XP, Vista, Mac OS X Leopard
Web Browser	Internet Explore 6 or above

☞ **Note:**

1. If you are using Windows 98 or Windows ME, please install IP Installer before using WEB UI to ensure the system runs normally.
2. If you can't view the record video file, please install **Xvid codec** while installing Intelligent IP Installer. (For Windows 98, ME or 2000 server, the codec might not work properly. You'll need to download Xvid codec 1.0 from the Internet.
3. Please always update the latest Windows component. (Net Framework, Windows Media Player, Enhance ActiveX Security)

Chapter 2 Physical Overview

2.1 Front View



Focus Adjustment Ring: Adjust the focus ring to get a clear image.

Network LED Indicator: It lights up when the IP Camera is well connected to the network. It flashes when there are data being transmitted.

Power LED Indicator: It lights up when the IP Camera is powered on.

Built-in Microphone: The location where the voice from your partner comes out.

2.2 Bottom view



Power Connector: The power connector is where you connect the power adapter.

Reset: Keep the device powered on. Press and hold the Reset Button for 10 seconds to restore the settings to factory defaults.

Audio Out (Speaker): The Audio Out (Speaker) port is where the speaker is connected.

LAN (Network Connector): Through this port, you can connect the IP Camera to your computer or the other Ethernet network devices.

Chapter 3 Using IP Camera via Web Browser

3.1 Windows Web Browser

1. Launch your web browser, and enter the IP address (the default value is 192.168.1.10) of the IP camera in the Location / Address field of your browser.



☞ Note:

If you only want to view the video without setting page, enter "http://<IP>/index2.htm" as your web URL . For example, you can enter "http://192.168.1.10/index2.htm" as your web URL to view the video without setting page.

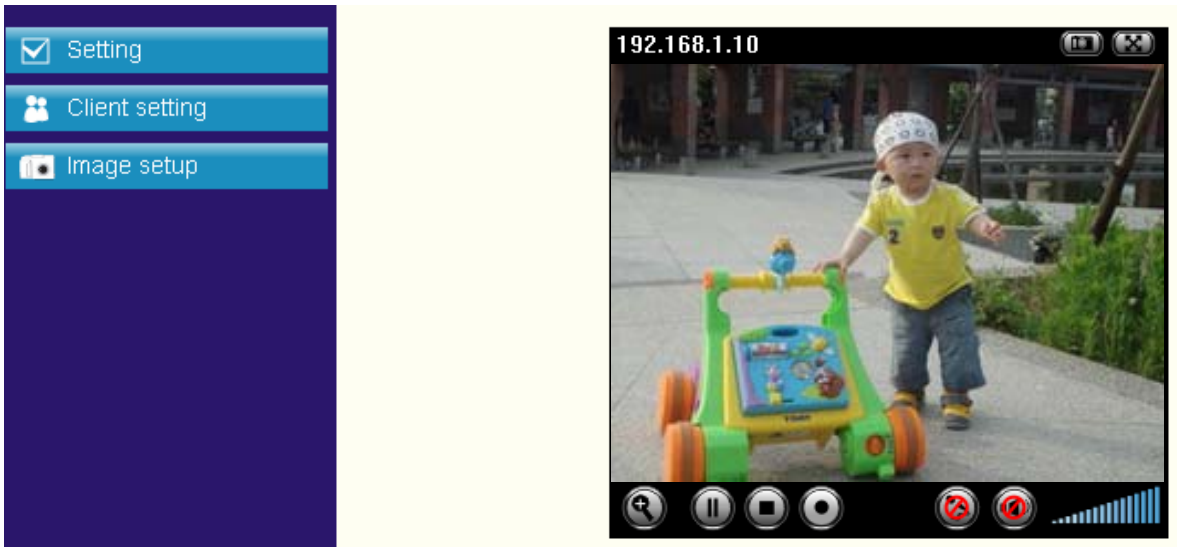
2. Enter the default User name "admin" and password "admin" in the login window as shown below.



☞ Note:

The default User name "admin" and Password "admin" are set at the factory for the administrator. You can change them in the Account Menu. (Please check "**Setting → Basic → Security → Account**")

3. The web-based management page will display on your screen. On the leftmost column of the web-based management page are **Setting**, **Client Setting**, and **Image Setup**. For more details, you can refer to **Section 5.2 Setting**、**Section 5.3 Client Setting** and **Section 5.4 Image Setup**.

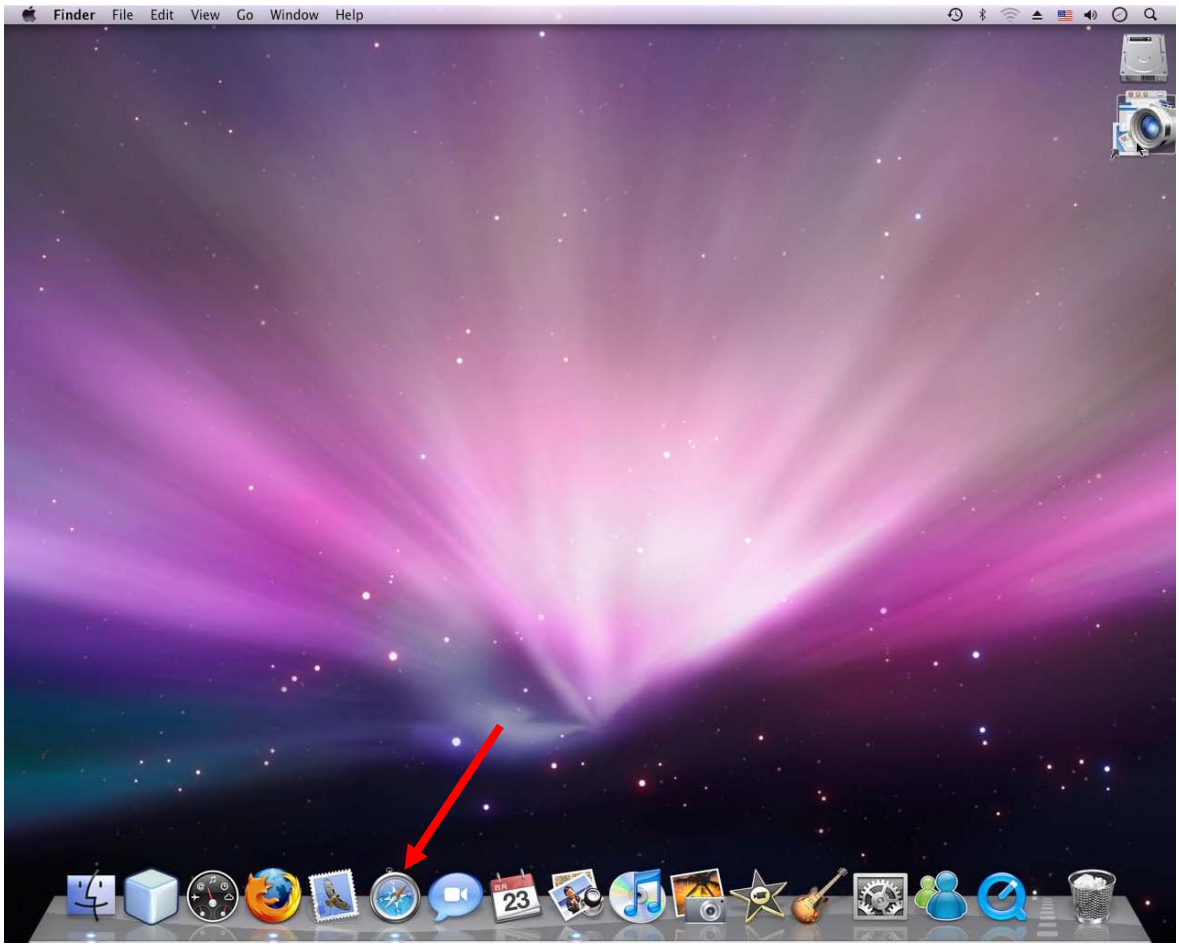


3.2 Mac Web Browser

1. Click the **Safari** icon on the screen as the figure below shown, and enter the IP address (the default value is 192.168.1.10) of the IP camera in the Location / Address field of your browser.

☞ **Note:**

If you only want to view the video without setting page, enter "http://<IP>/index2.htm" as your web URL. For example, you can enter "http://192.168.1.10/index2.htm" as your web URL to view the video without setting page.



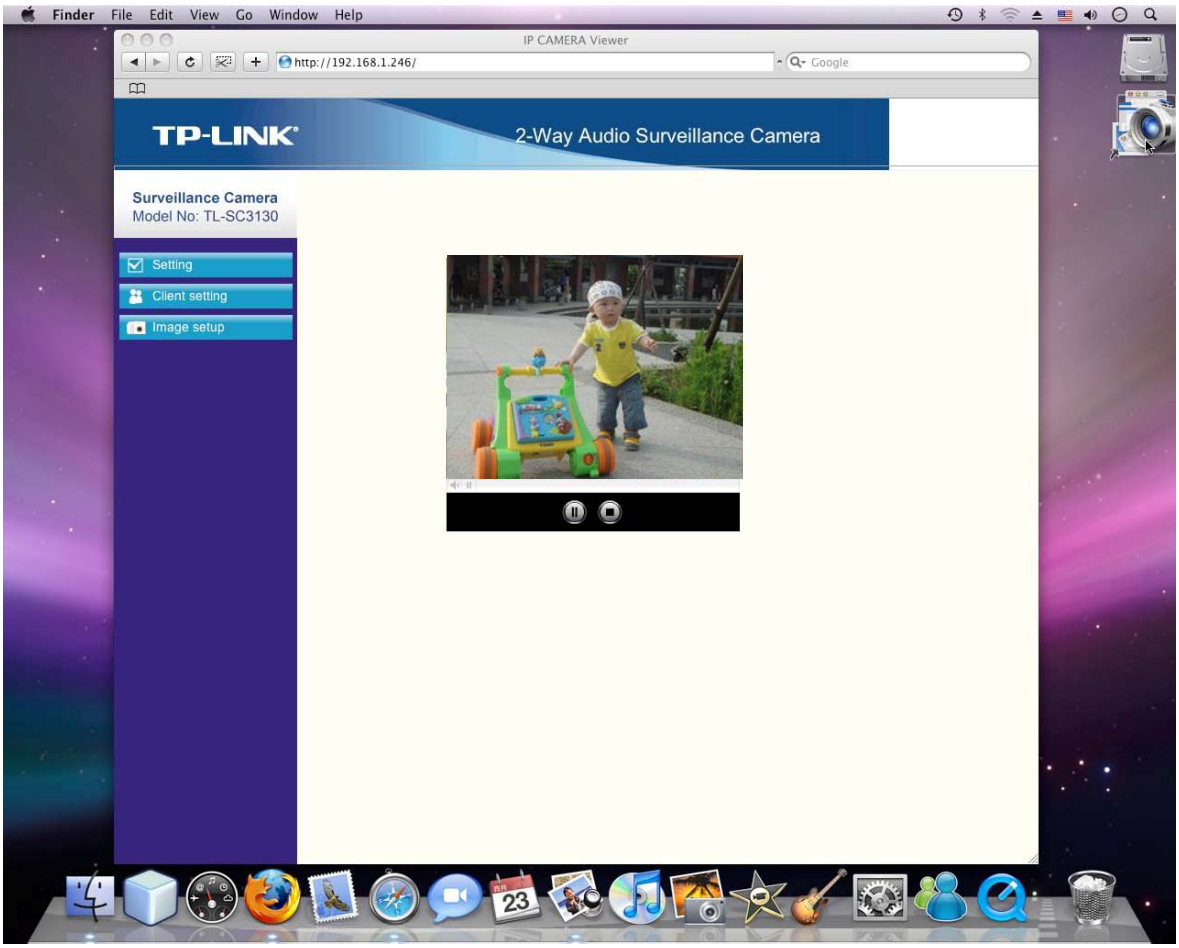
2. Enter the default User name “admin” and password “admin” in the dialog box as shown below.



☞ Note:

The default Name “admin” and Password “admin” are set at the factory for the administrator. You can change them in the Account Menu. (Please check “**Setting → Basic → Security → Account**”)

3. The web-based management page will be display on your screen. In the leftmost column of the web-based management page are **Setting**, **Client Setting**, and **Image Setup**. For more details, you can refer to **Section 5.2**、**Section 5.3** and **Section 5.4**.

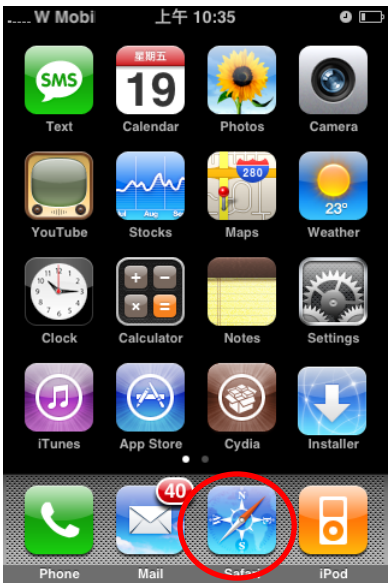


Chapter 4 Using IP Camera via Mobile Phone

4.1 Using IP Camera via iPhone

You can use Zavio Web User Interface via iPhone. Please follow the setting process as below. Then you can use Zavio web UI via iPhone.

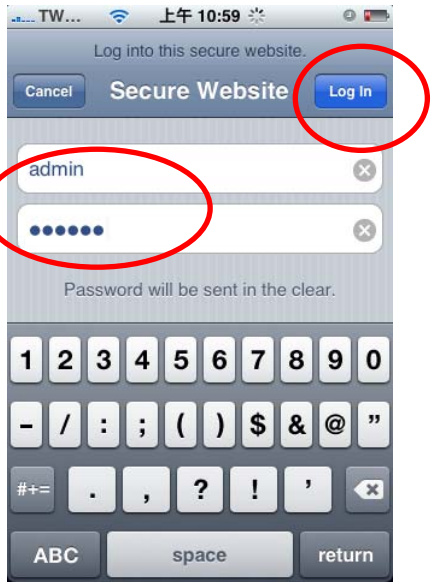
1. Select Safari function



2. Enter IP address in your web link.



3. Enter name and password. Default values are both admin. Then click Log in



4. The Zavio User Interface and live image will show up in the middle of the screen.



☞ **Note** It will show continuous snapshots not a real time video streaming. Therefore, the recording feature is disabled.

4.2 Mobile Phone Viewing

To use IP cameras via mobile phones, please make sure your RTSP is set to “On” (Default is “On”). To change the settings of IP cameras, **Please check “Settings → Basic → Camera → General.”**

1. 3G Mobile Phone Streaming Viewing

For 3G mobile phone viewing, type “rtsp://<IP>:<PORT>/video.3gp ” into your 3G Streaming Link. <IP> is the Public IP address of your IP camera (the default value is 192.168.1.10); <PORT> is the RTSP port of your IP camera (Default value is 554). For Example: rtsp://192.168.1.10:554/video.3gp

☞ **Note:**

You can also use RTSP clients (RealPlayer, VLC, QuickTime Player etc) to view RTSP streaming, just type in “rtsp://<IP>:<PORT>/video.3gp” as the Player URL.

2. 2.5G Mobile Phone WAP Viewing

For 2.5G mobile phone viewing, type “ <IP>/mobile.wml ” into your 2.5G WAP Browser. <IP> is the Public IP address of your IP camera.

3. 2.5G Mobile Phone Browser Viewing

For 2.5G mobile phone viewing, type “ <IP>/mobile.htm ” into your 2.5G Web Browser. <IP> is the Public IP address of your IP camera.

Chapter 5 Configuration of Main Menu

On the leftmost column of the web-based management page are **Setting**, **Client Setting**, **Image Setup**. For more details, you can refer to Section 5.2 Setting、Section 5.3 Client Setting、Section 5.4 Image Setup.



On the right column of the web-based management page, you can use Live View. There are four different functions which are **Snapshot**, **Zoom**, **Audio** and **Video Play.** You can see more details as follows.

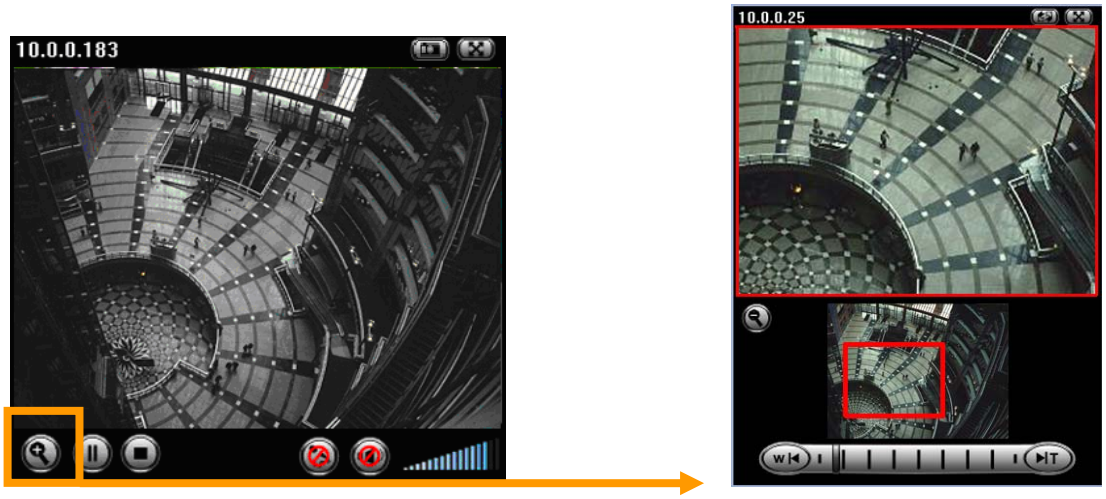
5.1 Live View

5.1.1 Snapshot

You can capture a still image shot by the camera and save it in your computer.

Symbols	Meaning
	Click it, a snapshot window will appear
Save	to save the picture in your computer
Close	to return to the view page
	full Screen

5.1.2 Zoom in / out the image via the monitor window



- Click  to display the digital zoom in window.
- Pull the  to adjust the digital zoom range, and it will be showed on the above window.
- You can use the left click of your mouse to move the  to any where on the window to view the desired detail more clearly.

5.1.3 Video play buttons

Symbols	Meaning
	Pause the current video
	Play the video
	Stop the current video
	Record the current video

5.1.4 Audio buttons

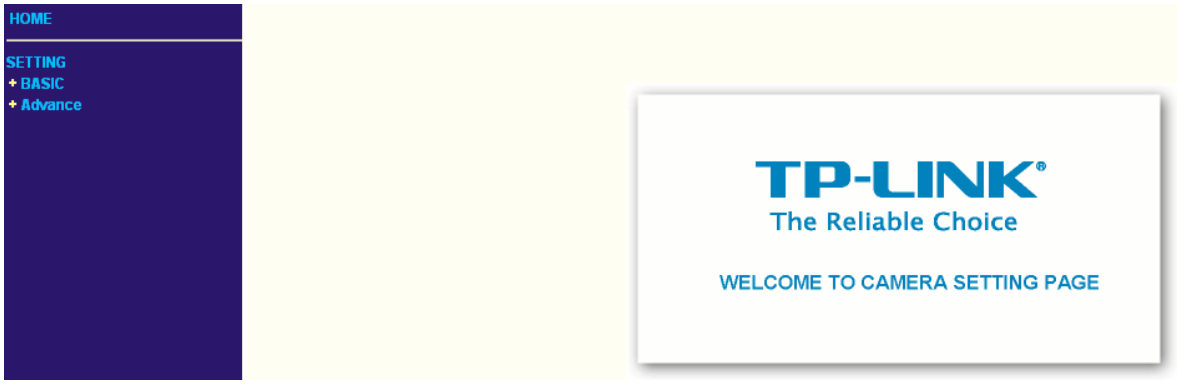
Symbols	Meaning	☞ Note

	Speakers turned on	**mean the speakers of your computer are turned on to transmit the sounds from the connected IP camera(s)**
	Speakers turned off	
	Microphone turned on	**mean you can broadcast to the connected IP camera(s) via the Ethernet using your microphone**
	Microphone turned off	
	Volume control bar	

5.2 Setting



This function is only for the Administrator. Click this button to get into the **Basic** and **Advance settings** menus.



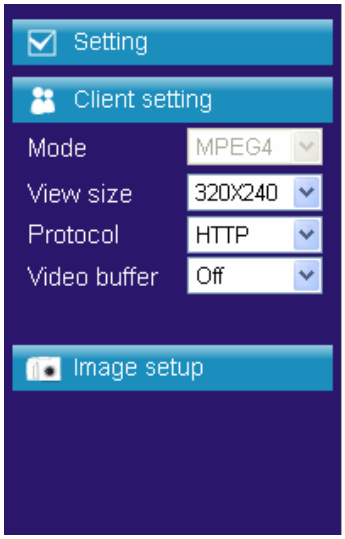
There are four sub-menus under the **BASIC** menu, which includes **System**, **Camera**, **Network**, and **Security**. For more information, you can refer to **Section 6.1**、**Section 6.2**、**Section 6.3** and **Section 6.4**.

There are six sub-menus under the **Advance** menu, which includes **FTP Client**, **SMTP**, **HTTP event**, **Schedule**, **Motion Detection**, and **System Log**. Fore more information, you can refer to **Section 7.1**、**Section 7.2**、**Section 7.3**、**Section 7.4**、**Section 7.5** and **Section 7.6**.

5.3 Client Setting



This function is only for the client.





Click this button to configure the settings of IP Camera, which includes **Mode**, **View Size**, **Protocol**, and **Video Buffer**.

5.3.1 Mode

Click the drop-down list to choose between **MPEG4** and **MJPEG video** compression mode.

☞ **Note:**

MJPEG streaming is unavailable if **RTSP mode** is On (Please check **Setting** → **Basic** → **Camera** → **General**).

5.3.2 View Size

Select the desired display image resolution to 640×480 or 320×240.

5.3.3 Protocol

Select the transferring protocol from **TCP**, **UDP**, **HTTP** and **Multicast**.

☞ **Note:**

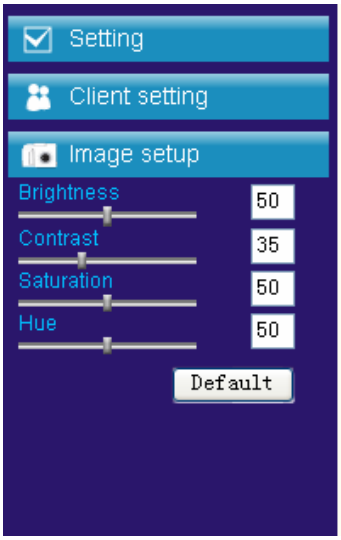
This item appears just after **RSTP mode** is enabled (selecting **Setting** → **Basic** → **Camera** → **General**)

5.3.4 Video Buffer

Turn the Video Buffer function ON / OFF. The Video Buffer function makes the streaming more smoothly in unsteady network environment, but might cause a little delay in live viewing

5.4 Image Setup







You can use the tool bar to optimize video **Brightness**, **Contrast, Saturation** and **Hue**.

5.4.1 Brightness

The higher value the **brightness** is, the brighter the image is.

5.4.2 Contrast

The contrast is a measure of a display system, defined as the ratio of white to black that the system is capable of producing. The higher value the **contrast** is, the more delicate color you can get.

5.4.3 Saturation

The saturation of a color is determined by a combination of light intensity and how much it is distributed across the spectrum of different wavelengths. The higher value the saturation is, the more colorful the image will be.

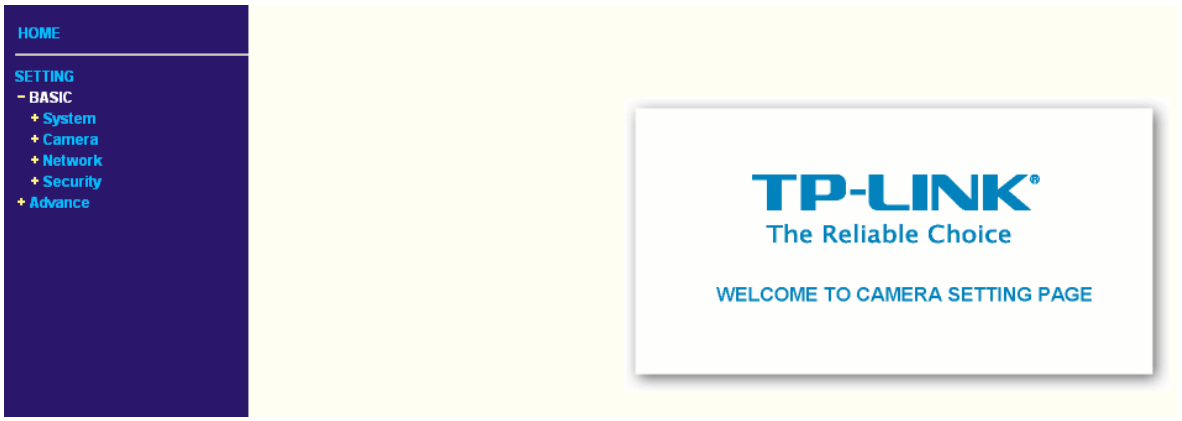
5.4.4 Hue

Hue is one of the three main attributes of perceived color, which is affected by different wavelength of color. With higher value of hue, color will be much more vivid.

5.4.5 Default

After the adjustment of all settings, you can still click **Default** to make the setting back to the factory default settings.

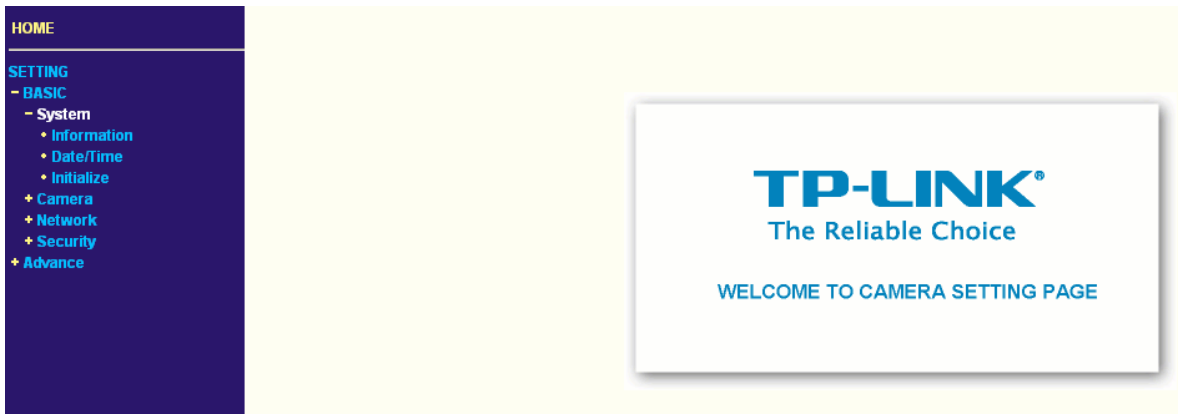
Chapter 6 Setting-Basic



Click **BASIC** to display the submenus including **System**, **Camera**, **Network**, and **Security**.

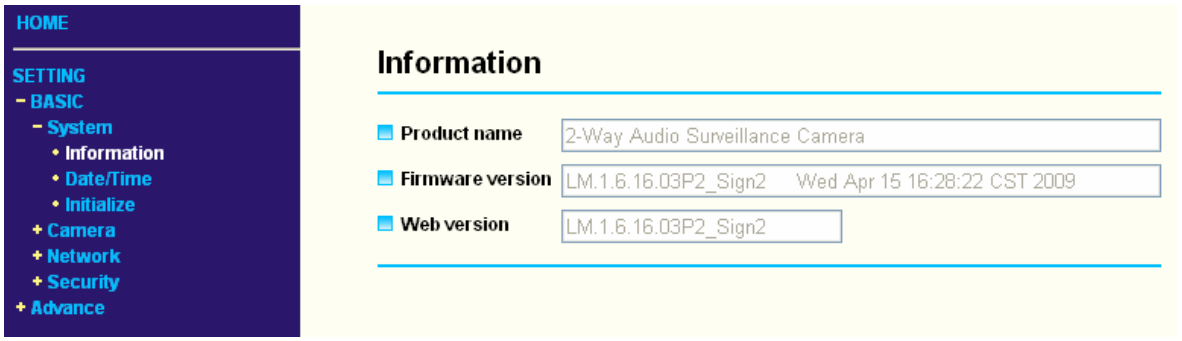
6.1 System

Click **System** to display the submenus including **Information, Date / Time, and Initialize.**



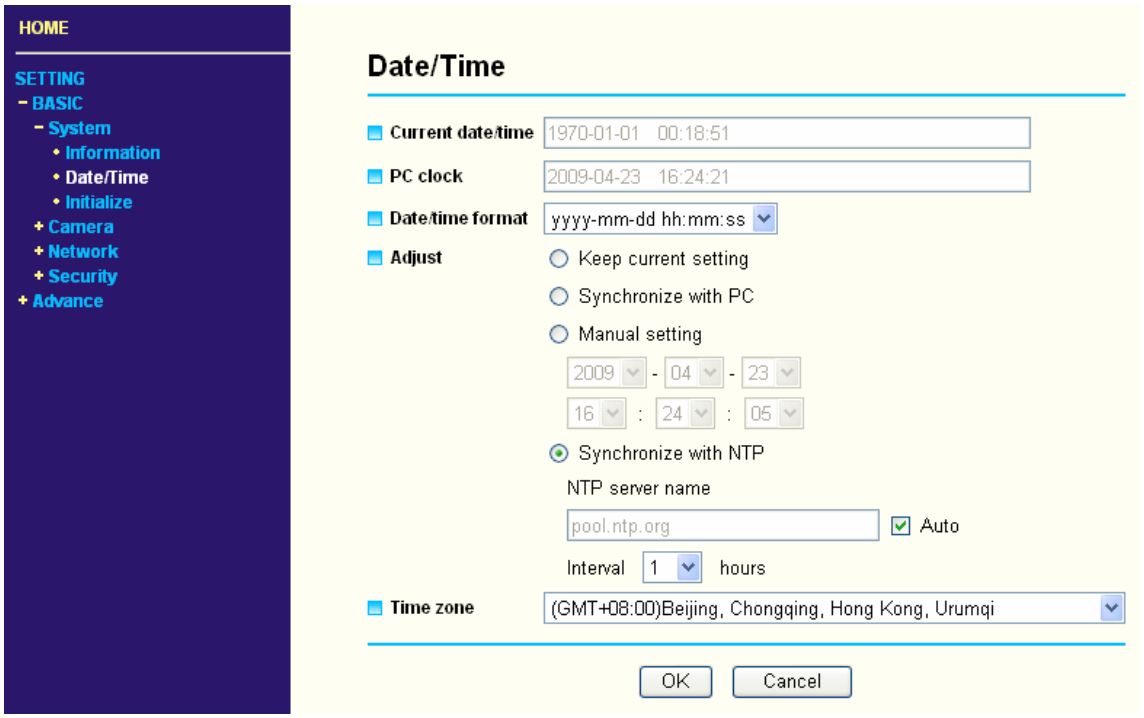
6.1.1 Information

The **Information** page provides the basic information of the product which includes Product Name, Firmware Version and Web Version.



6.1.2 Date / Time

The **Date/ Time** page displays all options of time setting.

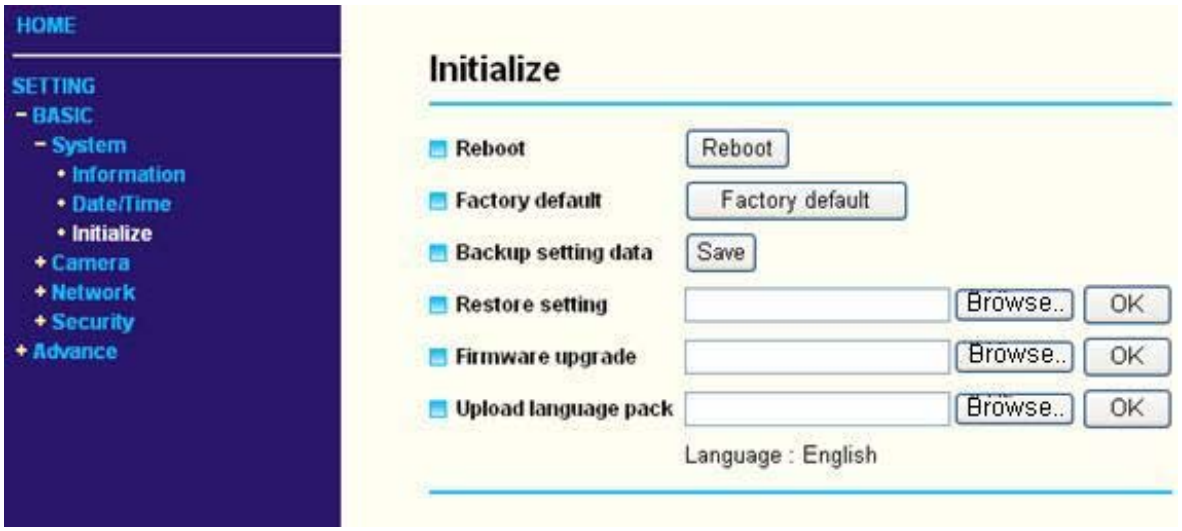


- **Current date / time**: Displays the current date and time of this IP Camera.
- **PC clock**: Displays the date and time of the monitoring PC clock.
- **Date / Time format**: You can click the drop-down list to select different time display formats.
- **Adjust**: You can select one of those four adjusting modes for your IP Camera.
  - **Keep current setting**: Select this mode to keep the current date and time of this IP Camera.
  - **Synchronize with PC**: Select this mode to keep the date and time of this IP Camera the same with the monitoring PC.
  - **Manual setting**: Select this mode to adjust manually the date and time of this IP Camera.
  - **Synchronize with NTP**: Specify the NTP server name and the Refresh Interval to synchronize the date and time of this IP Camera with those of the time server, known as the NTP server.
  - **Time Zone**: You can select the format from Greenwich Mean Time. The time displayed will be the same as the current date / time option.

☞ **Note:**

The NTP server (Network Time Protocol) is the time server which is an Internet standard protocol built on the top of TCP / IP. This assures accurate synchronization to the millisecond of computer clock time in a network of computers.

6.1.3 Initialize



- **Reboot:** Click this button to reboot this IP Camera. A confirmation dialogue will appear and then click **OK** to process. It takes two minutes to reboot this IP Camera.
- **Factory Default:** Click this button to reset this IP Camera to the factory default settings. A confirmation dialogue will appear and then click **OK** to process. The network LED indicator on the IP Camera will start to blink. This IP Camera will reboot automatically after the restoring has been finished. Don't turn off this IP Camera during this process.
- **Backup Setting:** You can save configuration setting data of this IP Camera into a file. Click **Save** and follow the instructions on the browser to save this setting data file to specified location.
- **Restore Setting:** Download the saved setting data of this IP Camera. Click **Browse…** and select the saved file. Click **OK** and this IP Camera is adjusted according to the loaded data and then restarted.
- **Firmware Upgrade:** Upgrade the device software. Click **Browse…** and select the file for upgrading. A confirmation dialogue will appear. Click **OK** to start. This IP Camera will reboot after upgrading has been finished.

☞ **Note:**

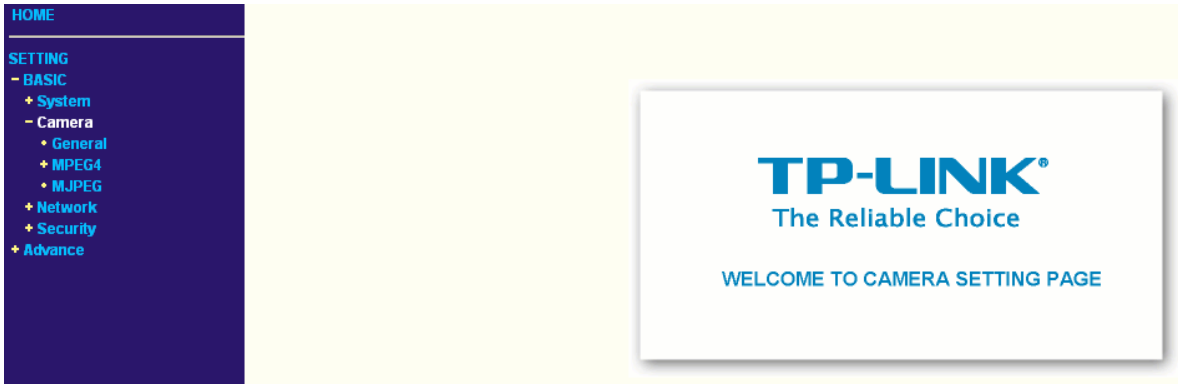
Use only upgrade files that are special for this IP Camera. Otherwise problems may occur. Don't turn off the IP Camera power or disconnect the network until the upgrading is completed.

- **Upload Language Pack**: Upgrade the device language pack. Click **Browse…** and select the file for upgrading. A confirmation dialogue will appear. Click **OK** to start upgrading. The

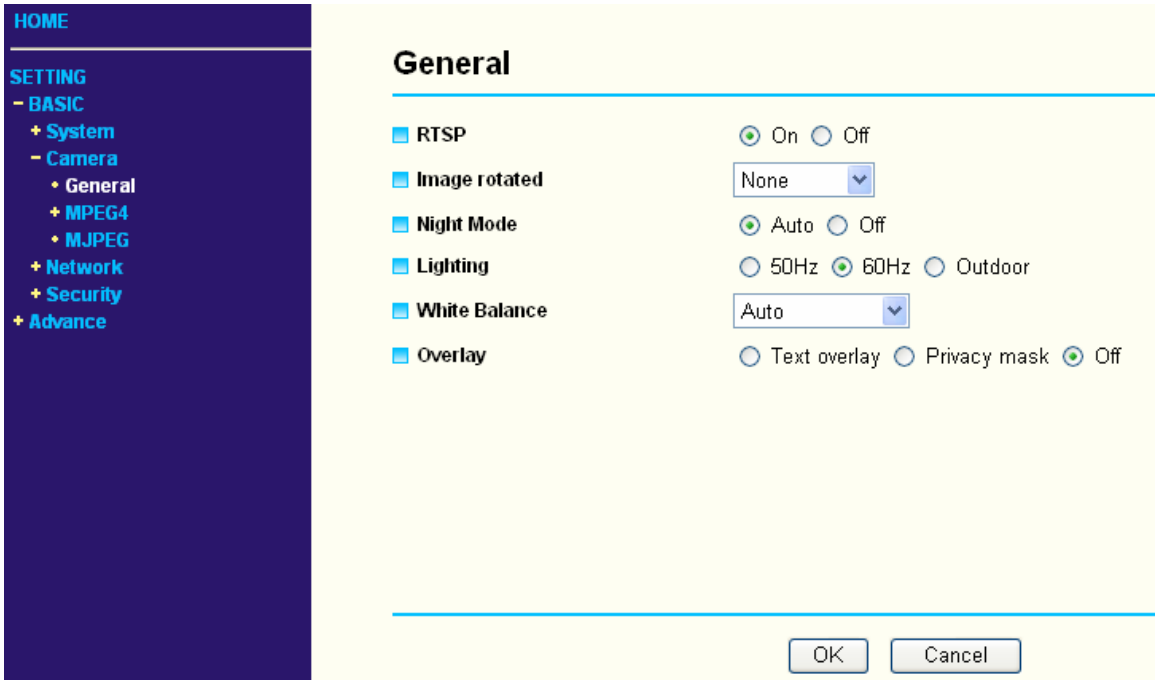
upgrade is applied immediately. The default language is “English.”

6.2 Camera

Click **Camera** to display the submenus including **General**, **MPEG4** and **MJPEG**.



6.2.1 General



- **RTSP**: Switch is On or Off

Note:

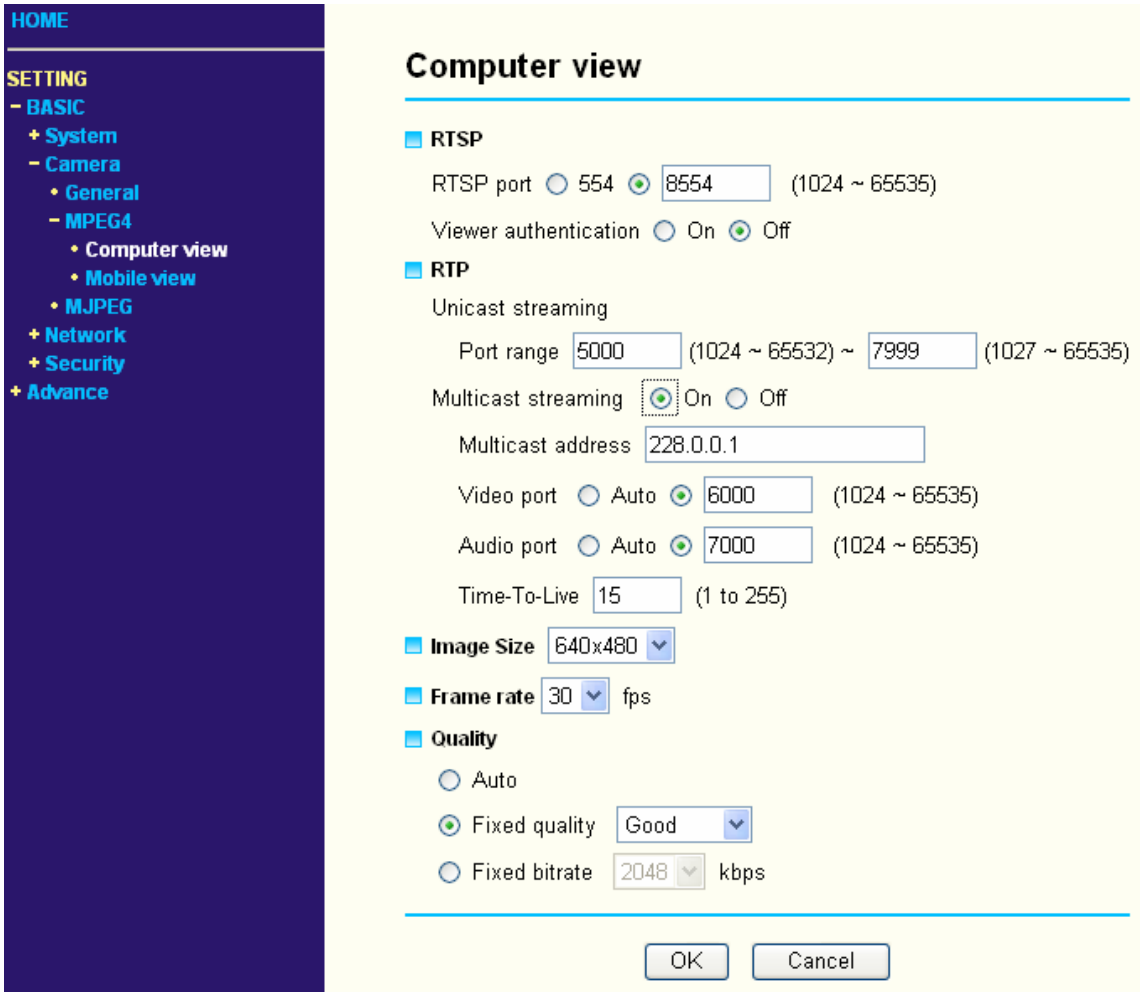
RTSP (Real Time Streaming Protocol) is a protocol used in streaming media system which allows clients to remotely control a streaming video server. RTSP is supports by most of the media clients such as Real Player, QuickTime and VLC...etc.

- **Image Rotate**: You can mirror or flip the display screen.

- **Night Mode**: You can choose Auto / Off. If you choose Auto option, the camera will adjust automatically to perform well when the environment is not bright enough.
- **Lighting**: You can choose the environment among 50 Hz, 60 Hz, and Outdoor.
- **White Balance**: You can choose the white balance to Auto, Florescent, Incandescent and Black & White.
- **Overlay**:
  - **Text Overlay**: You can see some information on the display screen which includes Date / Time and user-defined text. Also, you can change the background color.
  - **Privacy Mask**: You can cover a specific area of the video image.

6.2.2 MPEG4

A. Computer View



- **RTSP (if RTSP mode is On, please check "Setting → Basic → Camera → General")**
  - RTSP Port: Specify the transmission port number of RTSP streaming. The default value is

8554.

- Viewer Authentication: If the viewer authentication is **On**, the users will be requested to type in username and password when viewing through RTSP.

➢ **RTP (if RTSP mode is On, please check "Setting → Basic→ Camera → General")**

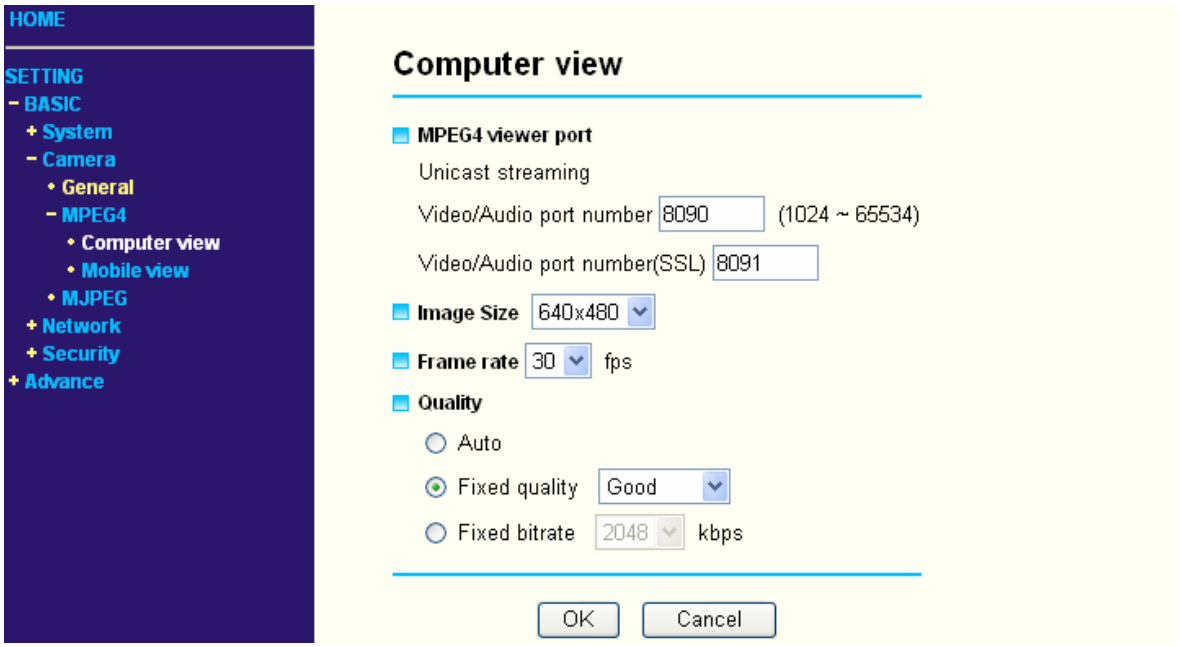
- **Unicast Streaming Video / Audio Port Range**: Specify the transmission port range of RTP streaming video. RTP will select a port randomly from this range.
- **Multicast Streaming (If it is ON)**
  - ✓ **Multicast Address**: Specify the multicast server address.
  - ✓ **Video / Audio Port**: Specify the transmission port number of the video data, which is an even number from 1024 to 65534.
  - ✓ **Time- to- Live**: Set the maximum TTL(Transistor-Transistor Logic) that multicast can pass through.

➢ **Image Size**: Specify the image size when the network camera transmits. You can choose among 640 x 480, 320 x 240, and 160 x 120.

➢ **Frame Rate**: Set the frame rate of the MPEG4 image. You can choose values from 5, 10, 15, 20, 25, and 30 fps. The unit "fps" stands for "frames per second".

➢ **Quality:**

- **Auto**: The quality and bitrate will be adjusted automatically according to the frame rate.
- **Fixed Quality**: You can select the value of quality among Medium, Good, Delicate and Excellent.
- **Fixed Bitrate**: Set the bitrate of MPEG4 image transmission for a line. You can select the values from 64, 128, 256, 384, 512, 768, 1024, 1280, 1536, and 2048 kbps.

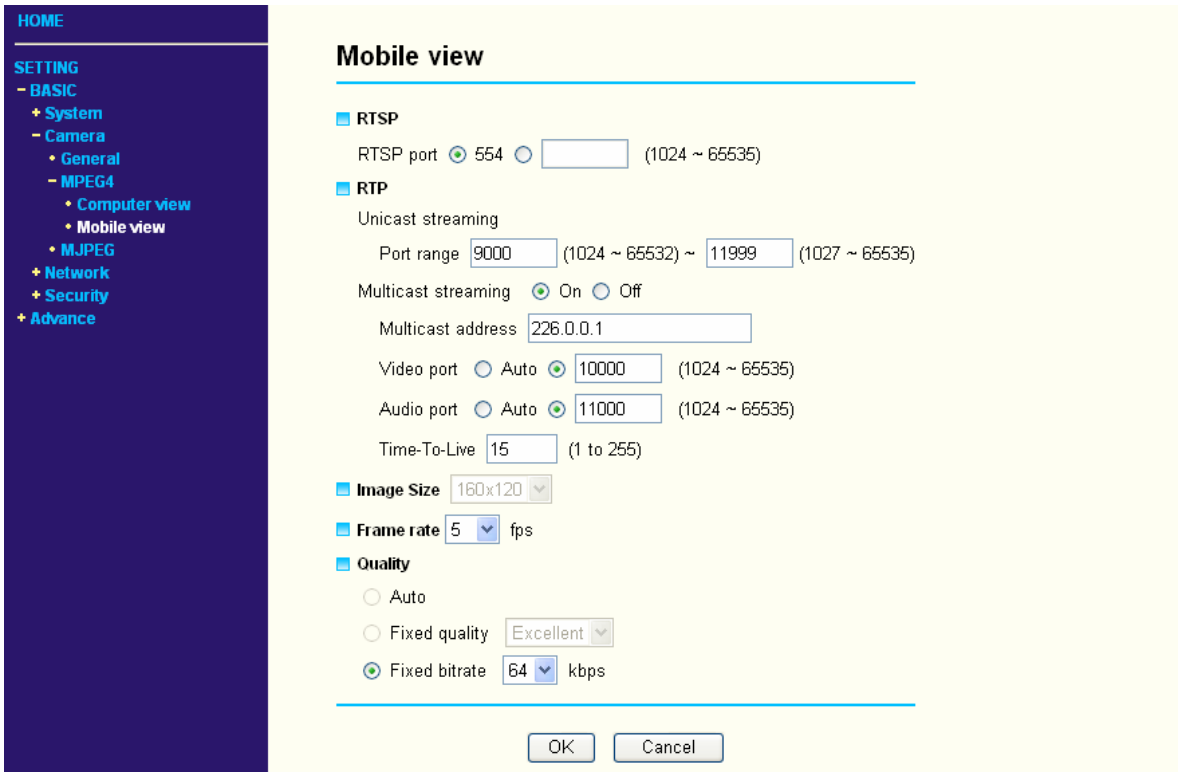


➢ **MPEG4 view port (if RTSP mode is Off, please check "Setting →Basic → Camera →**

General")

- **Unicast Streaming Video / Audio Port Numbe**r: Specify the transmission port number of the video data (the default value is 8090). You can specify an even number from 1024 to 65534. If you change the setting of Video / Audio Port Number, the setting of Video / Audio Port Number (SSL) will change automatically.

B. Mobile View



➢ **RTSP (if RTSP mode is On, please check "Setting → Basic → Camera → General")**

- **RTSP Port**: Specify the transmission port number of RTSP streaming. The default value is 554.

➢ **RTP (if RTSP mode is On, please check "Setting → Basic → Camera → General")**

- **Unicast Streaming Video / Audio Port Range**: Specify the transmission port range of RTP streaming video. RTP will select a port randomly from the range.
- **Multicast Streaming (If it is ON)**
  - ✓ **Multicast Address**: Specify the multicast server address.
  - ✓ **Video / Audio Port**: Specify the transmission port number of the video data, which is an even number from 1024 to 65534. It is set to 10000 and 11000 by default.
  - ✓ **Time- to- Live**: Set the maximum TTL(Transistor-Transistor Logic) that multicast can pass through.

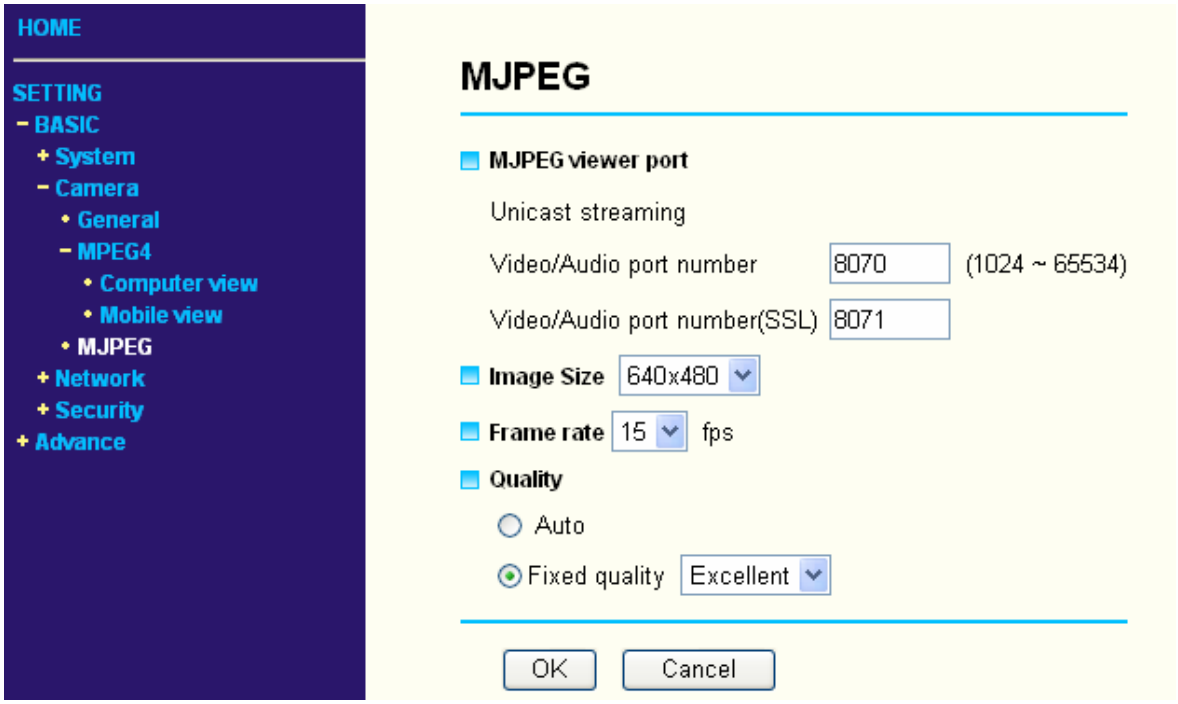
➢ **Image Size**: The image size of Mobile View is fixed at 160 x 120.

➢ **Frame Rate**: Set the frame rate of the MPEG4 image. You can choose values from 5, 10, 15,

20 fps. The unit “fps” stands for “frames sent per second”.

- **Quality:**
  - **Fixed Bitrate**: Set the bitrate of MPEG4 image transmission for a line. You can select the value from 64, 32, 16 kbps.

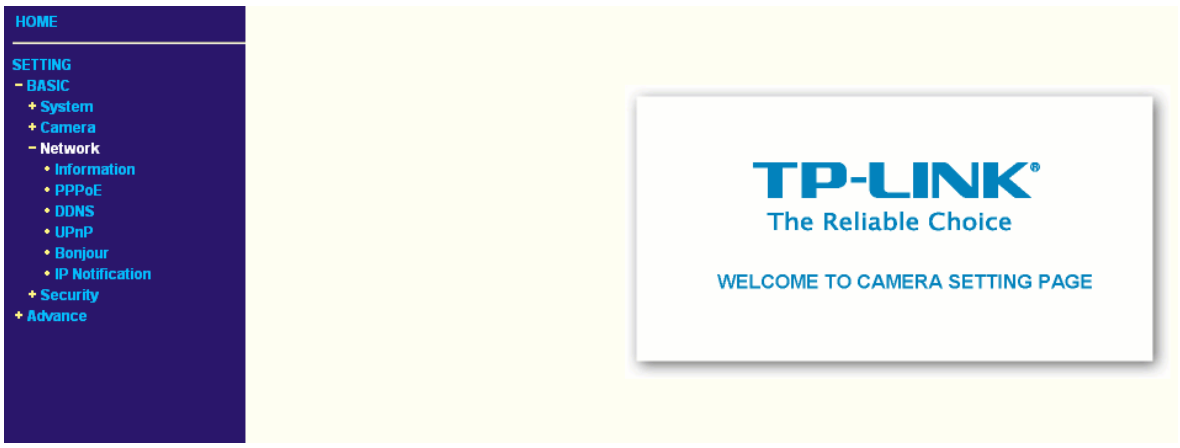
6.2.3 MJPEG



- **MJPEG Viewer Port (If RTSP is off, please check “Setting → Basic → Camera → General”)**
  - **Unicast Streaming Video / Audio Port Number**: Specify the transmission port number of the video data (the default value is 8070). You can specify an even number from 1024 to 65534. If you change the setting of Video / Audio Port Number, the setting of Video / Audio Port Number (SSL) will change automatically.
- **Image Size**: Specify the image size when the network camera transmits. You can choose among 640 x 480, 320 x 240, and 160 x 120.
- **Frame Rate**: Set the frame rate of the MJPEG image. You can choose values from 5, 10, 15 fps. The unit “fps” stands for “frames per second”.
- **Quality:**
  - **Auto**: The quality will be automatically decided.
  - **Fixed Quality**: You can select the value of quality among Medium, Standard, Good, Delicate and Excellent.

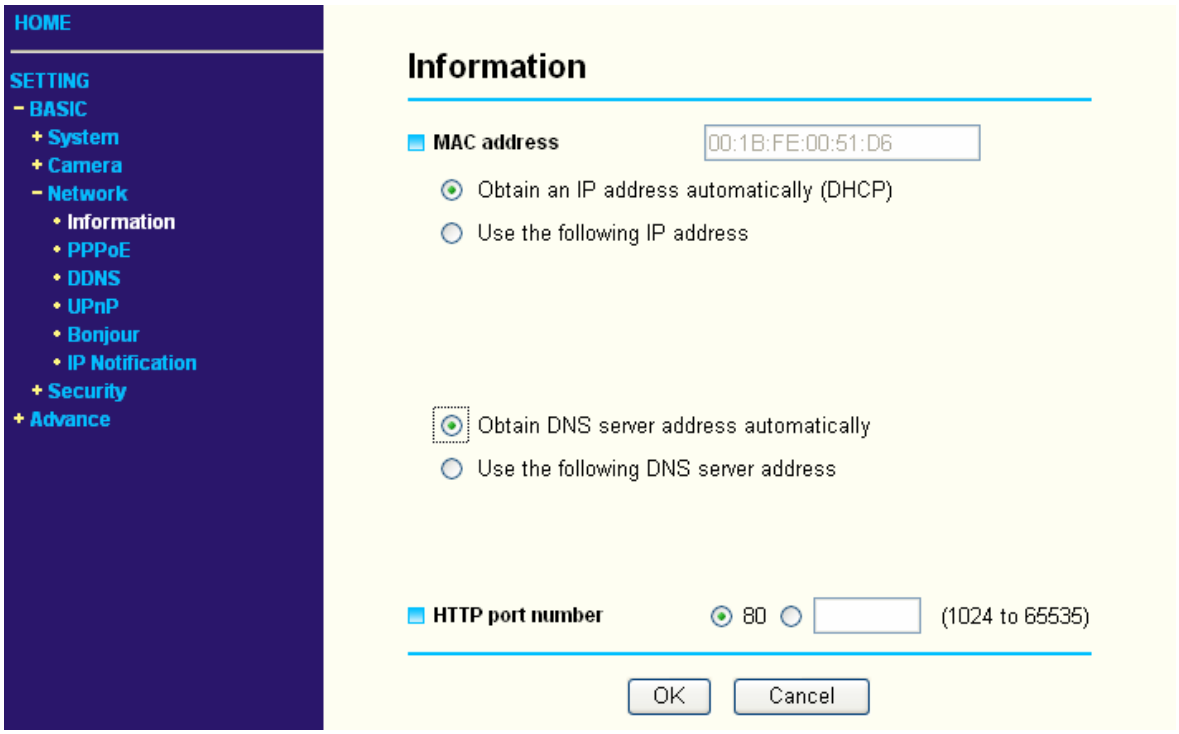
6.3 Network

Click **Network** to display the submenus including **Information, PPPoE, DDNS, UPnP, Bonjour, IP Notification.**

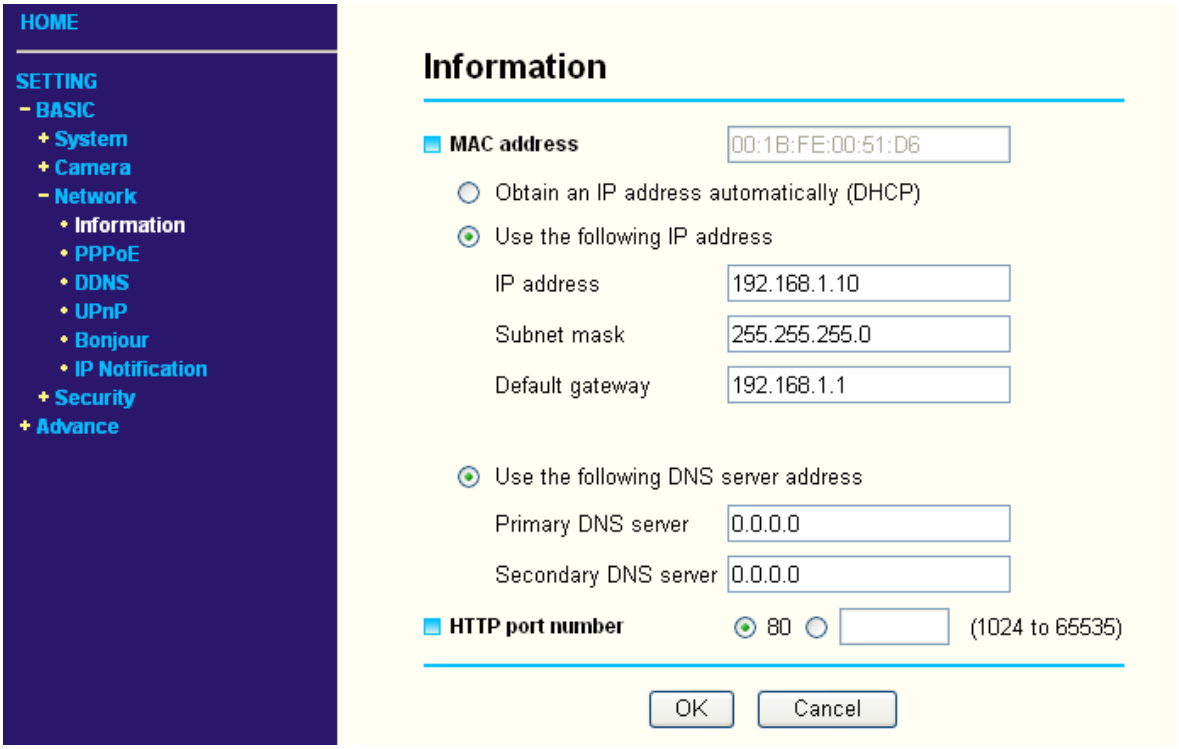


6.3.1 Information

The page of **Information** displays the MAC address of the device.



- **Obtain an IP address automatically (DHCP)**: (If a DHCP server is installed on the network) Select this, the IP will be assigned by the DHCP serve.
- **Obtain DNS server address automatically**: Select this to obtain the address of DNS server automatically.



- **Use the following IP address**: Select this when the fixed IP address is set.
  - **IP address**: Enter the IP address of the device.
  - **Subnet mask**: Enter the subnet mask.
  - **Default gateway**: Enter the default gateway.
- **Use the following DNS server address**: Select this when you set the fixed IP address as the IP address of DNS server.
  - **Primary DNS server**: Enter the IP address of the primary DNS server.
  - **Secondary DNS server (optional)**: Enter the IP address of the secondary DNS server if necessary.
- **HTTP port number**: Select 80 in general situations. If you want to use a port number other than 80, select the text box and enter a port number between 1024 and 65535.
  - When you have set the HTTP port number to a number other than 80 on the Network setting page or in the Setup Program, access the device by typing the IP address of the device on the web browser as follows: for example, when HTTP port number is set to 2000, you should type in http://192.168.1.100:2000/ to access the device.

☞ **Note:**

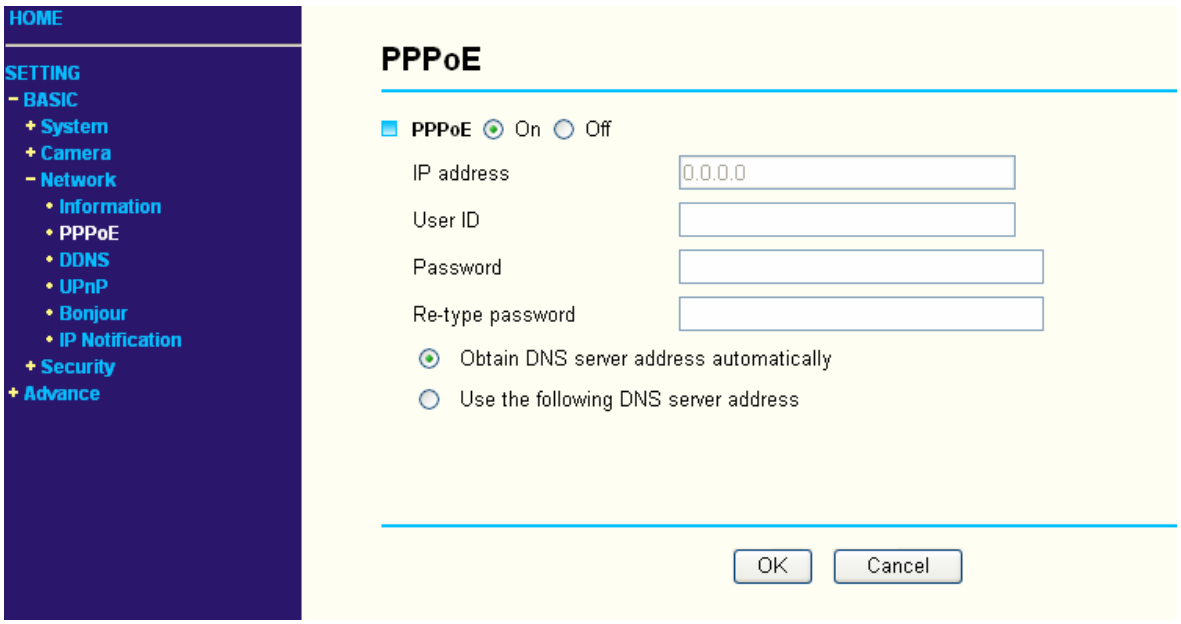
The IP Camera needs to be rebooted after it finishes changing the network setting completely.

☞ **Note:**

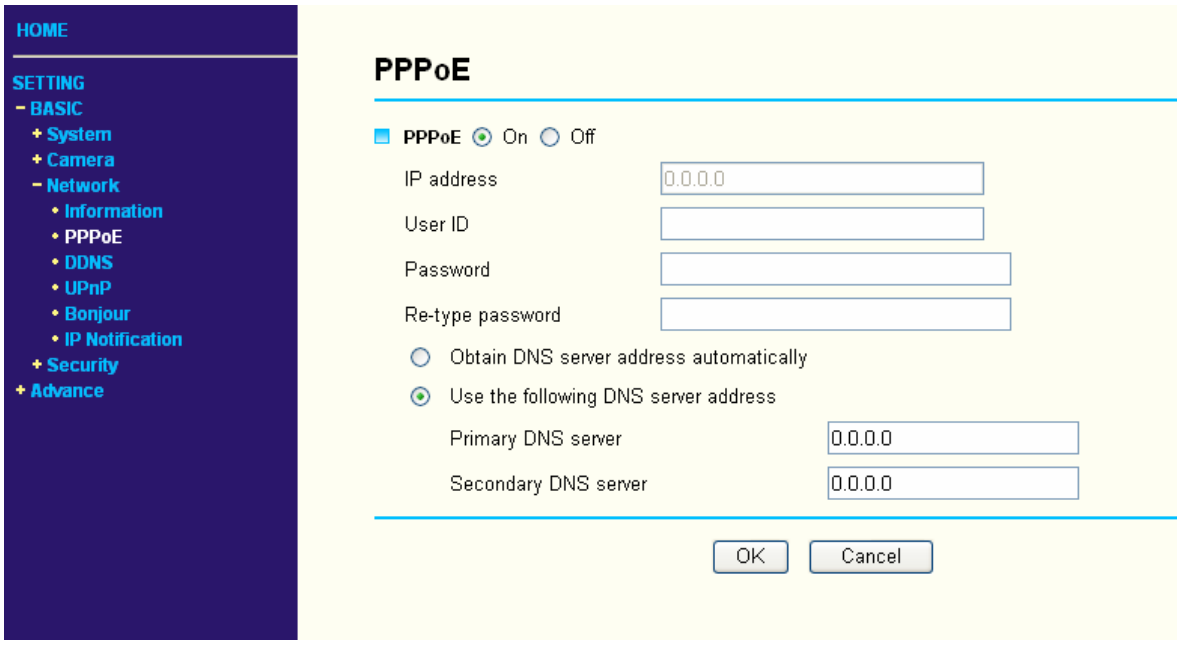
If you connect the IP Camera with your computer directly, the default network domain of camera is 192.168.1.x

6.3.2 PPPoE (Point-to-Point Protocol over Ethernet)

If your ISP provides Dynamic IP with authentication by username and password, enter all PPPoE information in this part. When you use the PPPoE function, you need to turn on the DDNS or IP Notification function at the same time.



- **IP address**: The IP address obtained when the IP camera connecting with network at PPPoE.
- **User ID**: Enter the user ID for authentication necessary for PPPoE connections. Type it up to 64 characters.
- **Password**: Enter the password for authentication necessary for PPPoE connections. Type it up to 32 characters.
- **Re-type password**: Re-type the password to confirm.
- **Obtain DNS server address automatically**: Select this to obtain the address of DNS server automatically.



➢ **Use the following DNS server address**: Select this when you set the fixed IP address as the IP address of DNS server.

- **Primary DNS server**: Enter the IP address of the primary DNS server.
- **Secondary DNS serve**r: Enter the IP address of the secondary DNS server.

☞ **Note:**

1. **PPPoE (Point-to-Point Protocol over Ethernet):** PPPoE is a network protocol for encapsulating Point-to-Point Protocol frames insider Ethernet frames. PPPoE connection is used mainly with ADSL service where individual users connect to the ADSL transceiver (modem) over Ethernet work. It also widely used in XDSL (digital affiliate line such as ADSL, VDSL or SDSL)

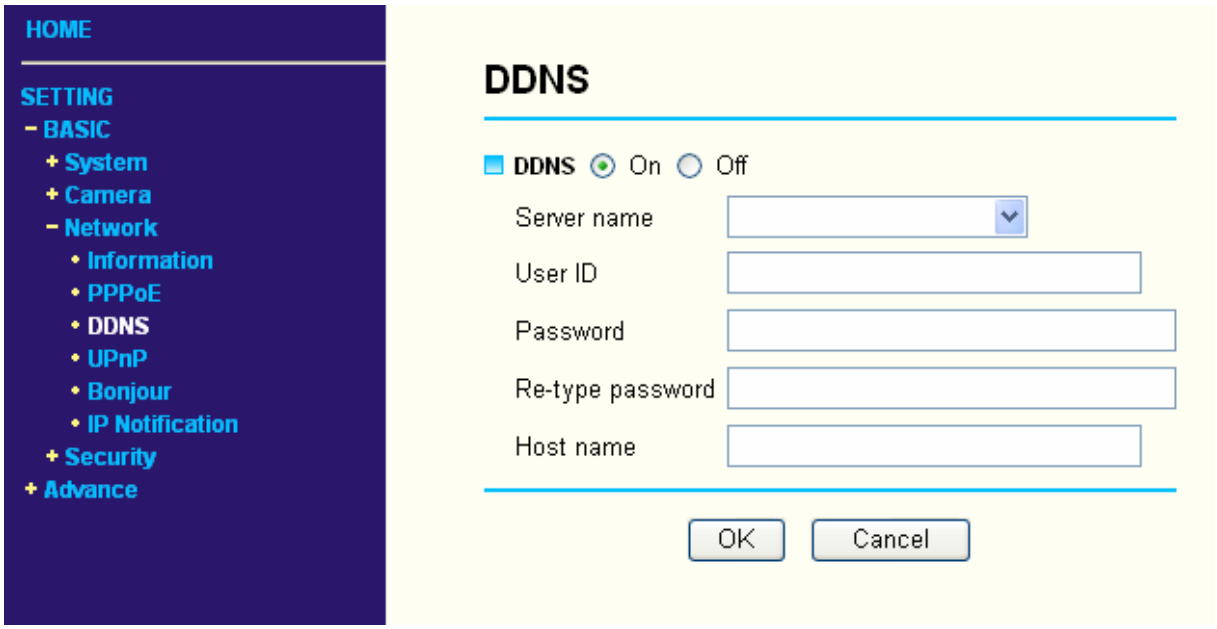
2. The IP Camera needs to be rebooted after it finishes changing the network completely.

3. The IP Camera with Intelligent IP Installer can't be founded after enabling the PPPoE and rebooting.

6.3.3 DDNS (Dynamic DNS)

Choose menu "**Dynamic DNS**", you can configure the Dynamic DNS function.

The IP Camera offers the **DDNS** (Dynamic Domain Name System) feature, which allows the hosting of a website, FTP server, or e-mail server with a fixed domain name (named by yourself) and a dynamic IP address, and then your friends can connect to your server by entering your domain name no matter what your IP address is. Before using this feature, you need to sign up for DDNS service providers such as www.dyndns.org, or www.no-ip.com. The Dynamic DNS client service provider will give you a password or key.



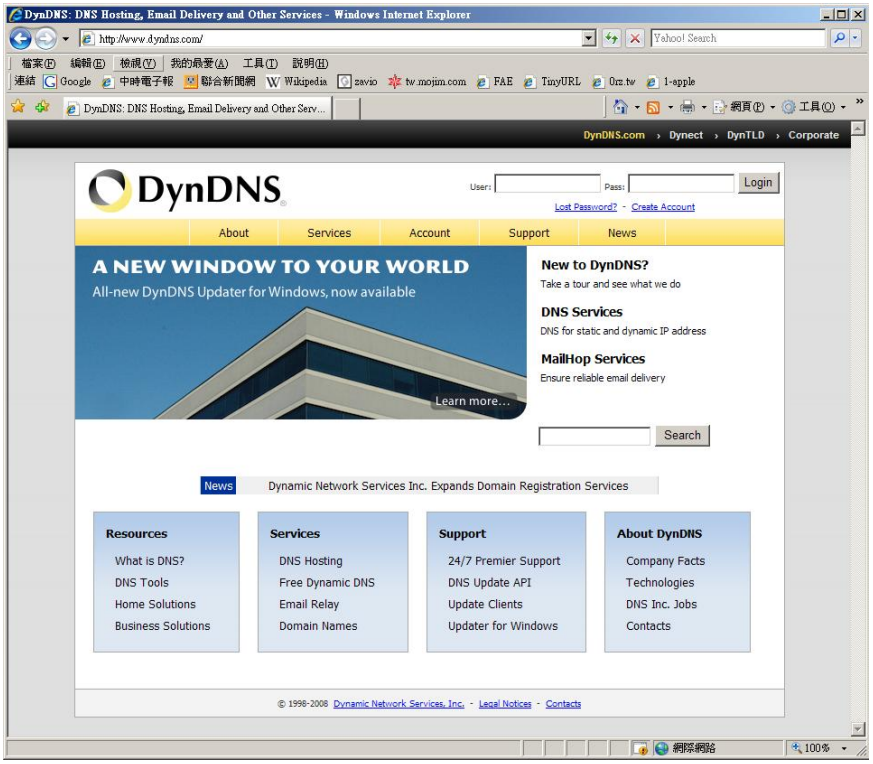
- **Server name**: Choose the DDNS Server from the list.
- **User ID**: Enter the user ID for authentication necessary for DDNS connections. Type it up to 64 characters.
- **Password**: Enter the password for authentication necessary for DDNS connections. Type it up to 32 characters.
- **Re-type password**: Re-type the password to confirm.
- **Host name**: Enter the host name that is registered to the DDNS server.

☞ **Note:**

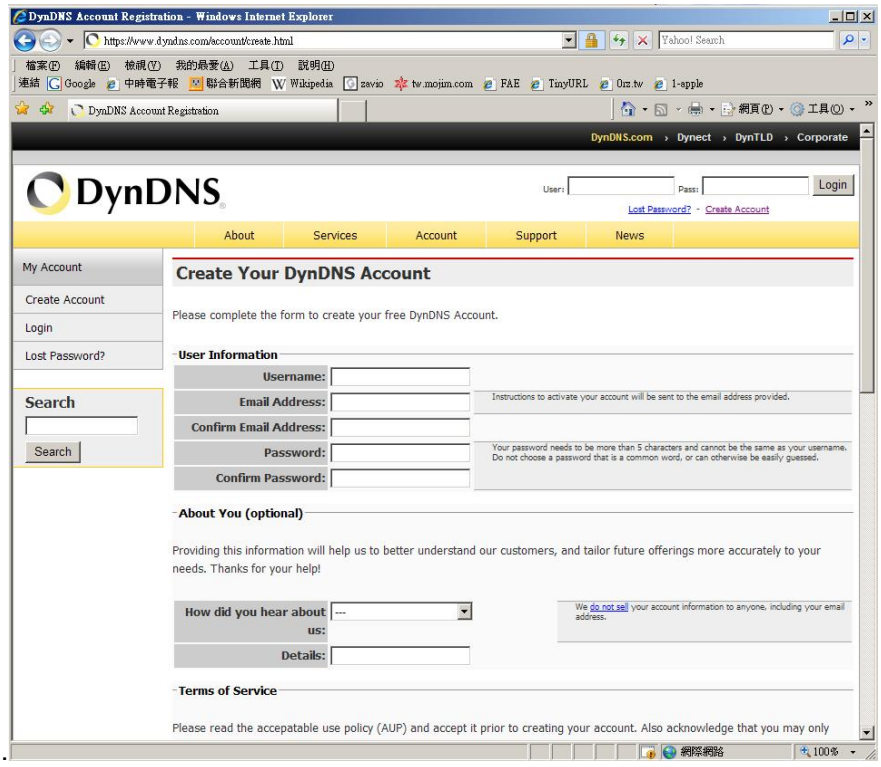
How to apply DDNS username and Host name?

You can apply DDNS username and Host name by the following steps:

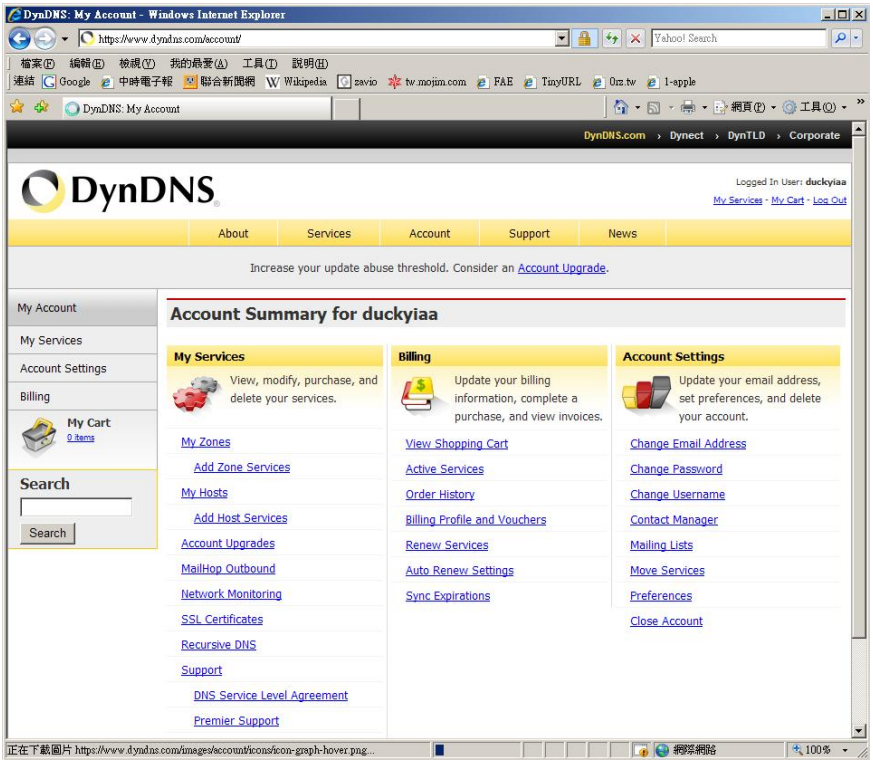
1. Log in http://www.dyndns.org, click the **Create Account**.



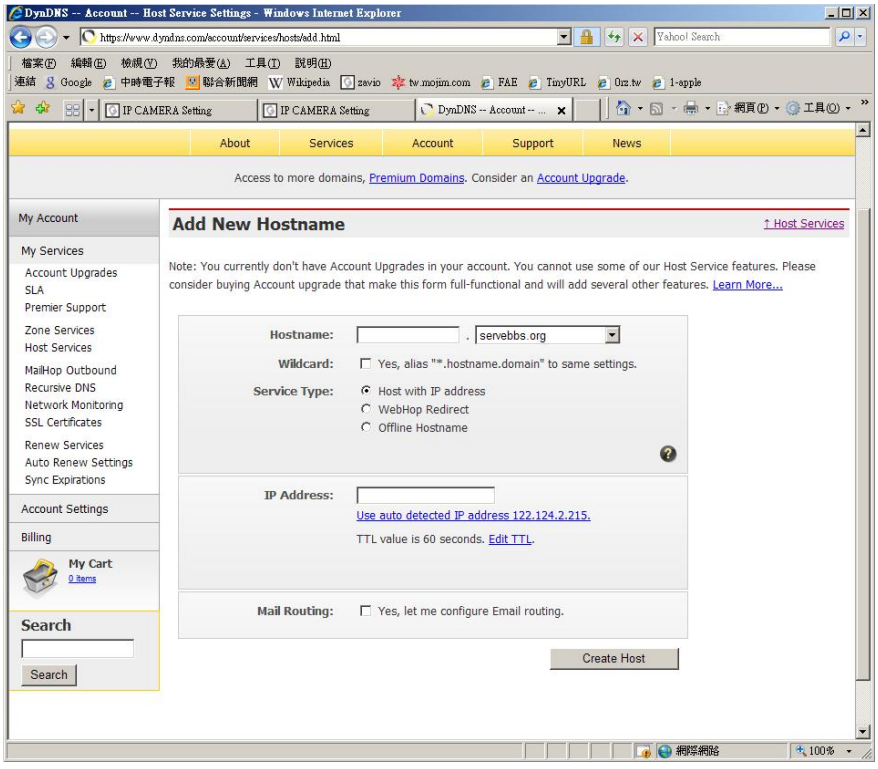
2. Input all information and follow step by step with DynDNS.



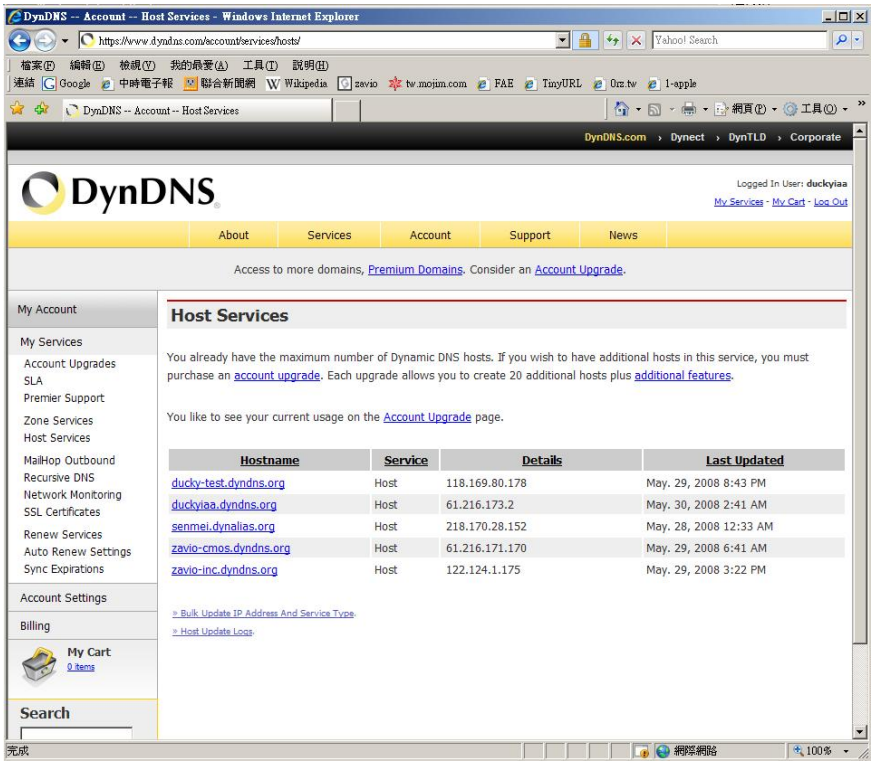
3. Log in with new account and click **Account** → **My Hosts** → **Add Host Services**.



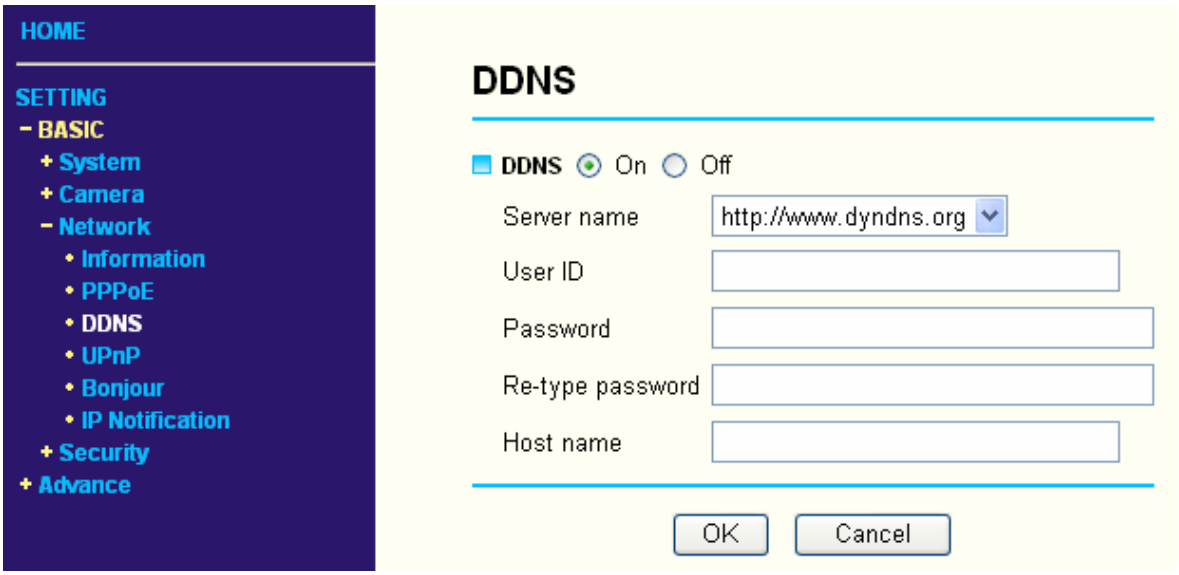
4. Type domain in the **Hostname** field and select sub-domain.



5. After typing in information, check your DDNS service.

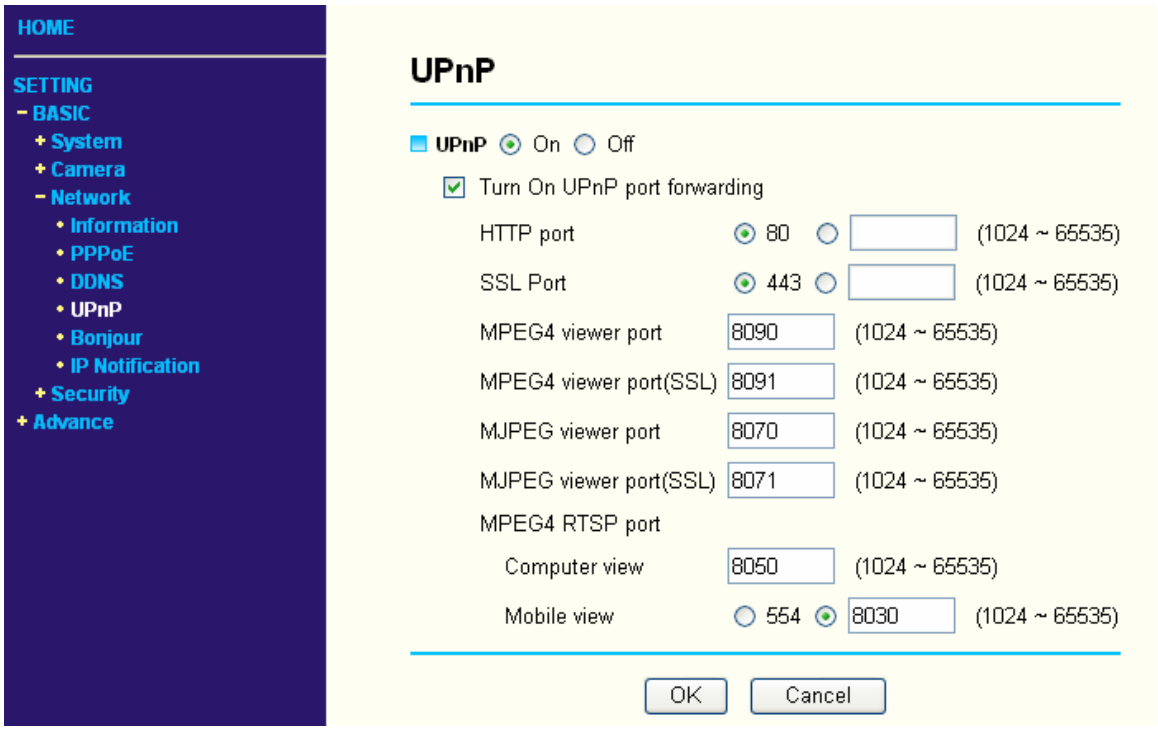


6. Type your DDNS **User ID**, **Password** and **Host name** in **Setting** → **Network** → **DDNS**. After completing setting, reboot IP Camera.



6.3.4 UPnP (Universal Plug and Play)

Choose menu "**Network→UPnP**", you can view the information about **UPnP** (Universal Plug and Play) in the screen as shown in the following figure. The UPnP feature allows the devices, such as Internet computers, to access the local host resources or devices as needed. UPnP devices can be automatically discovered by the UPnP service application on the LAN.



- **HTTP port**: Enter the HTTP port number and the default HTTP port is 80.
- **SSL port**: Enter the SSL port number and the default SSL port is 443.
- **MPEG4 viewer port**: Enter the MPEG4 viewer port number and the default MPEG4 viewer port is 8090.
- **MPEG4 viewer port (SSL)**: Enter the MPEG4 SSL viewer port and the default MPEG4 viewer port number is 8091.
- **MJPEG viewer port**: Enter the MJPEG viewer port number and default MJPEG viewer port is 8070.
- **MJPEG viewer port (SSL)**: Enter the MPEG4 SSL viewer port and default MJPEG viewer port number is 8071.
- **MPEG4 RTSP port**: Enter the MPEG4 RTSP port, default value is 8050 for computer view, 8030 for mobile view.

☞ **Note:**

UPnP (Universal Plug and Play): UPnP is a set of computer network protocol. It allows devices to connect seamlessly and simplify the implementation of networks at home and corporate environments. The device supports UPnP which is enabled by default. The device will be automatically detected and a new icon will be added to “My Network Place” if it also enables on your computer. It provides Port Forwarding for opening a port in a router or firewall in a private network in order to let a party from the outside world contact a inside user.

6.3.5 Bonjour

Bonjour, also known as zero-configuration networking, enables automatic discovery of computers, devices, and services on IP networks. **Bonjour** uses industry standard IP protocols to allow devices to automatically discover each other without the need to enter IP addresses or configure DNS servers.



➢ **Device Name**: Enter Device Name to your needs.

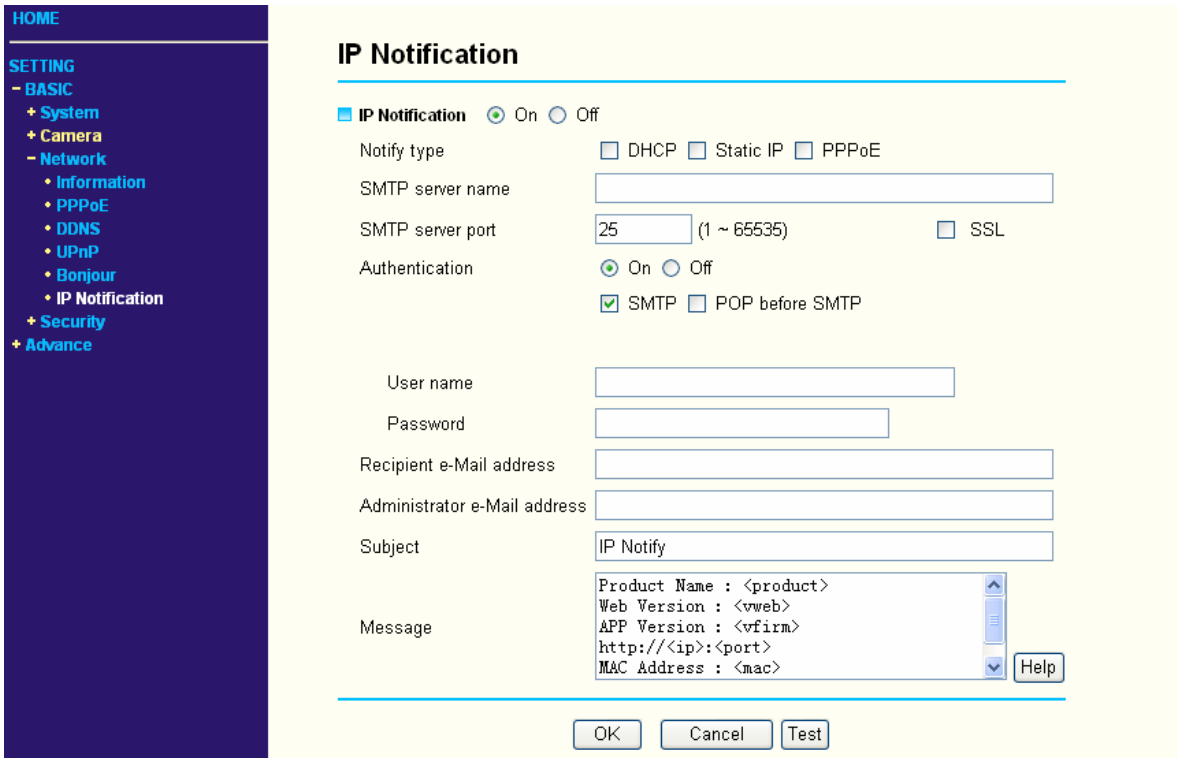
☞ **Note:**

How to use Bonjour in your Windows Browser UI? Please check the link below:

http://www.apple.com/support/downloads/bonjourforwindows.html

6.3.6 IP Notification

When network notify type is set to “ON”, you can send an e-mail notification of the completion of the network setting.

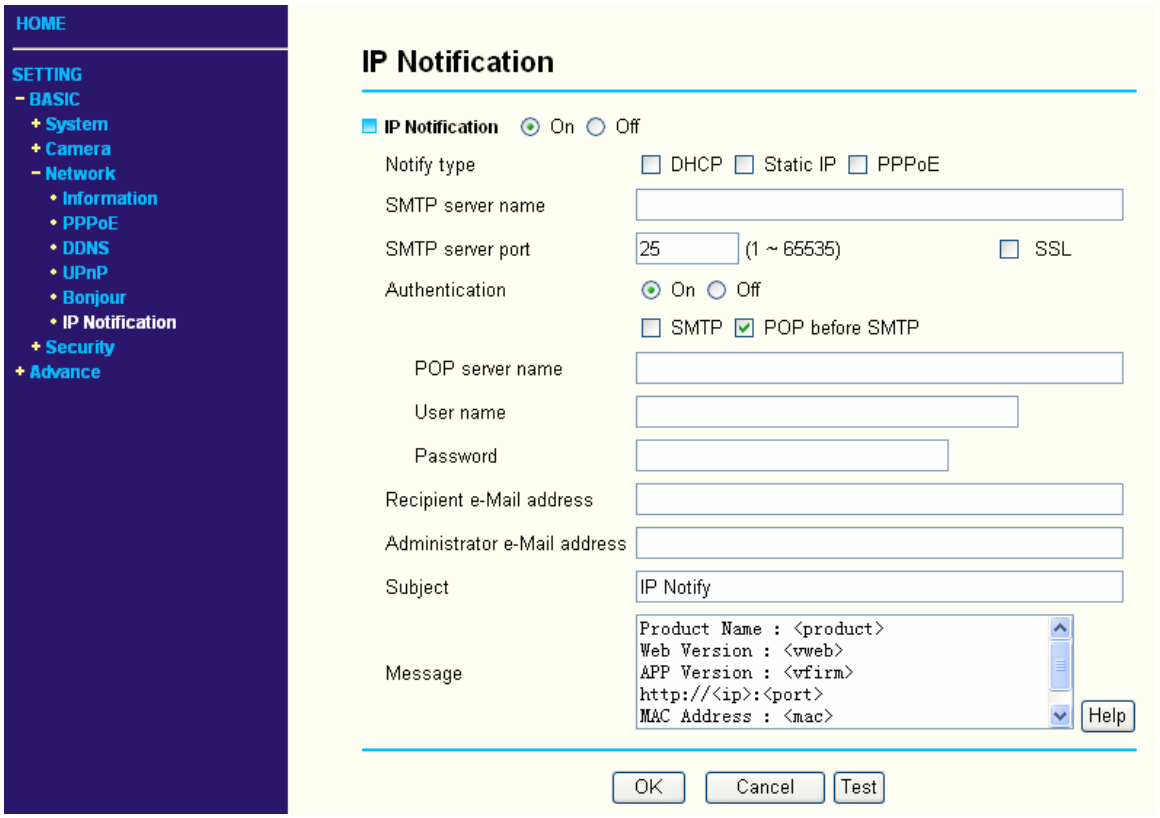


- **Notify Type**: You can select the notify type among DHCP, Static IP, and PPPoE.
- **SMTP Server Name**: Type the SMTP server name up to 64 characters, or the IP address of the SMTP server.
- **SMTP Server Port**: You can set port number from 1~65535 according to your mail server. The default value is 25.
  - **SSL**: It is Security setting. Checking **SSL** box if the mail server you use has security restriction.

☞ Note:

If you use g-mail as your mail server, you should set 587 as your port number and check **SSL** box.

- **Authentication**: Select the authentication required when you send an email.
  - **Off**: Select this if no authentication is necessary when an email is sent.
  - **On**: If authentication is necessary when an e-mail is sent, there are **SMPT**, **POP before SMPT** or **both** three options.
  - **SMTP**: Select this if SMTP authentication is necessary when an e-mail is sent.
  - **POP before SMTP**: Select this if POP before SMTP authentication is necessary when an e-mail is sent. If this option is selected, the **IP Notification** page will be different as following figure shown.



- **POP server name**: It is necessary when the POP before SMTP is selected in Authentication. Type the POP (receiving mail) server name up to 64 characters, or type the IP address of the POP server. This setting is necessary when the SMTP server which sends e-mails performs authentication using the POP user account.
- **User name, Password**: Type the user name and Password of the user who has the mail account. This setting is necessary when the SMTP server which sends e-mails performs authentication.

➢ **Recipient e-mail address**: Type the recipient e-Mail address up to 64 characters. You can specify up to three recipient E-mail addresses.

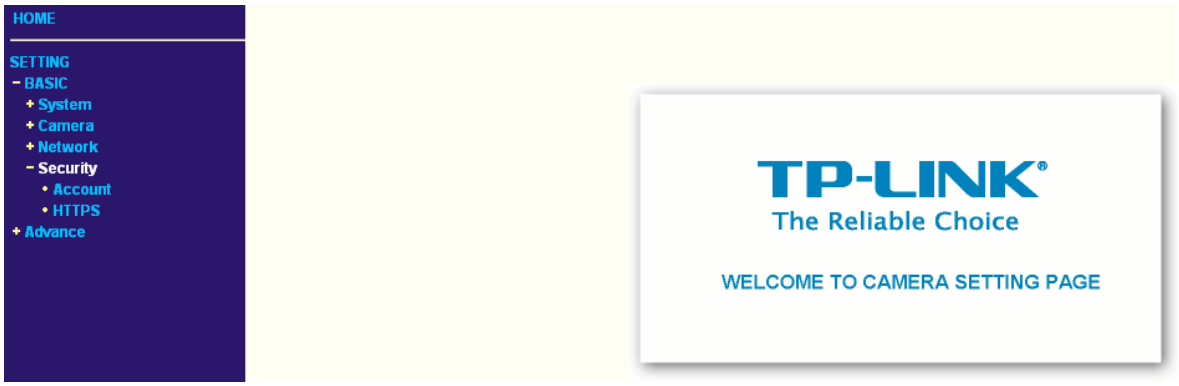
➢ **Administrator e-mail address**: Type the Administrator e-Mail address up to 64 characters. This address is used for reply mail and sending system messages from the SMTP server.

➢ **Subject**: Type the subject/title of the e-Mail up to 64 characters. With respect to mail which is sent according to the IP notification.

➢ **Message**: Type the text of the E-mail up to 384 characters. Default value provides network information including IP, Port, MAC, Model, Firmware Version and Web Version.

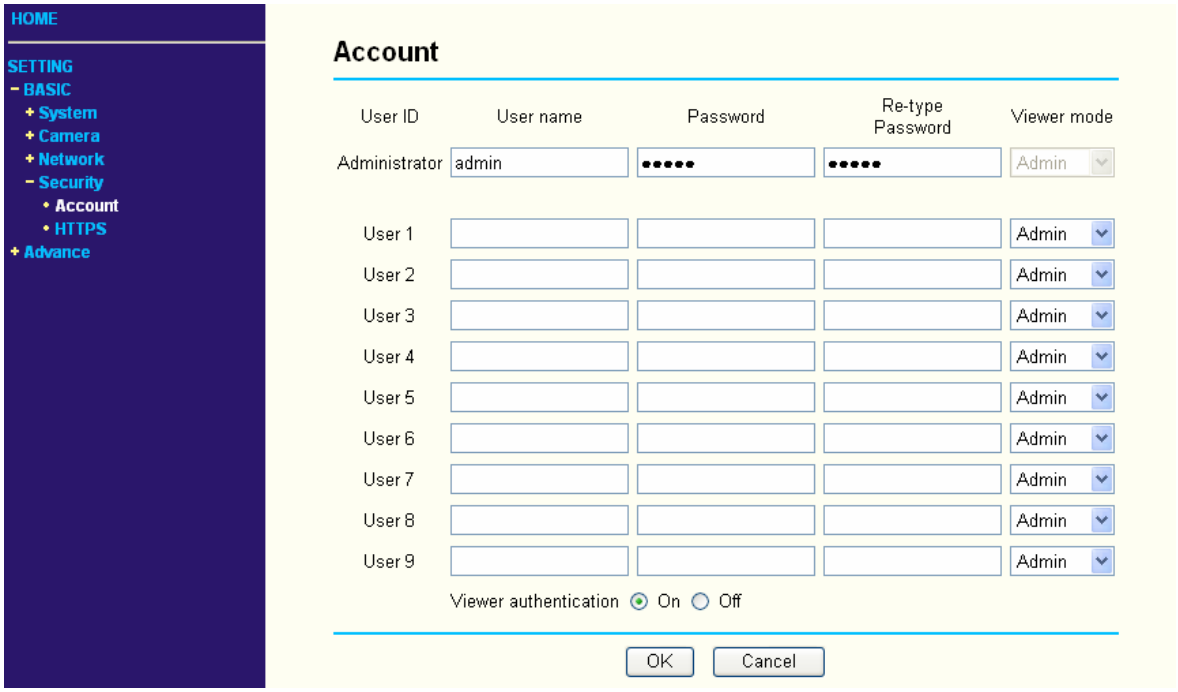
6.4 Security

Click **Security** to display the submenus including **Account** and **HTTPS**.



6.4.1 Account

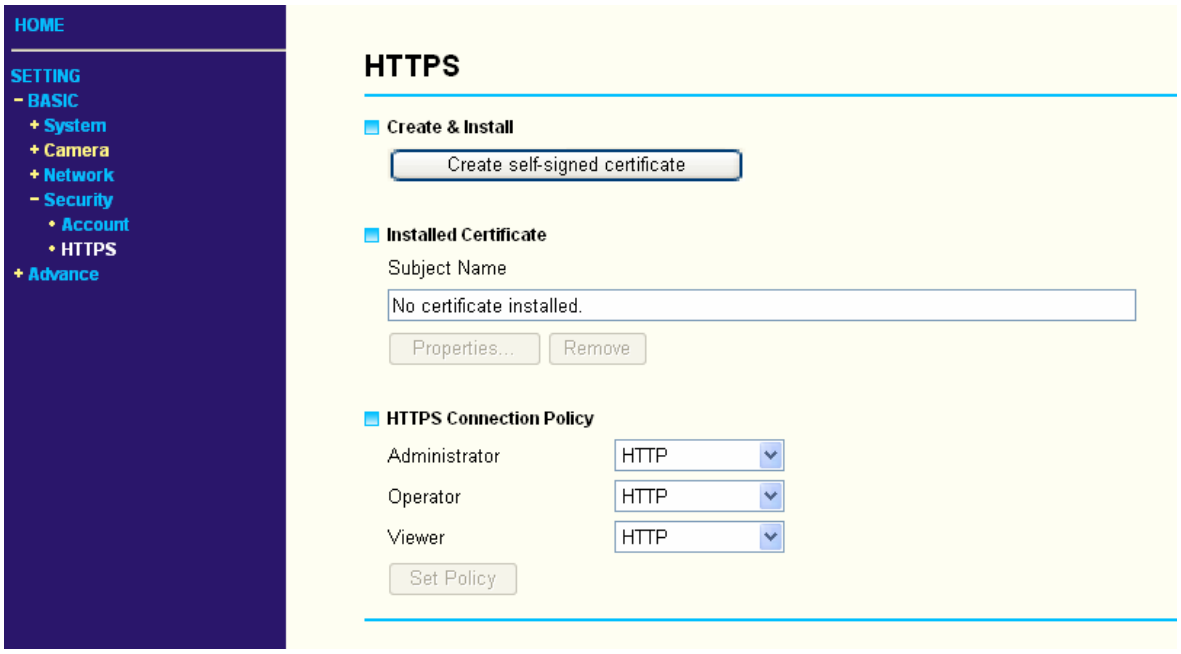
The device default account and password setting is “admin / admin”. That means everyone who knows IP address can access the device including all configuration. Therefore, it is necessary to assign a password if the device is intended to be accessed by others.



- **User name**: Set a user name between 4-16 characters.
- **Password**: Set a password between 4-16 characters.
- **Re-type Password**: Re-type the password to confirm.
- **Viewer Mode**: Set the user mode among Admin, Operator, and Viewer. Different viewer mode has different limits of authority.
  - The Admin mode has all authority of configuration.
  - The Operator mode can not only view the Live View but also control the PTZ (apply in speed dome).
  - The Viewer mode only can view the Live View.
- **Viewer Authentication**: Allows all viewers directly access to Live View.

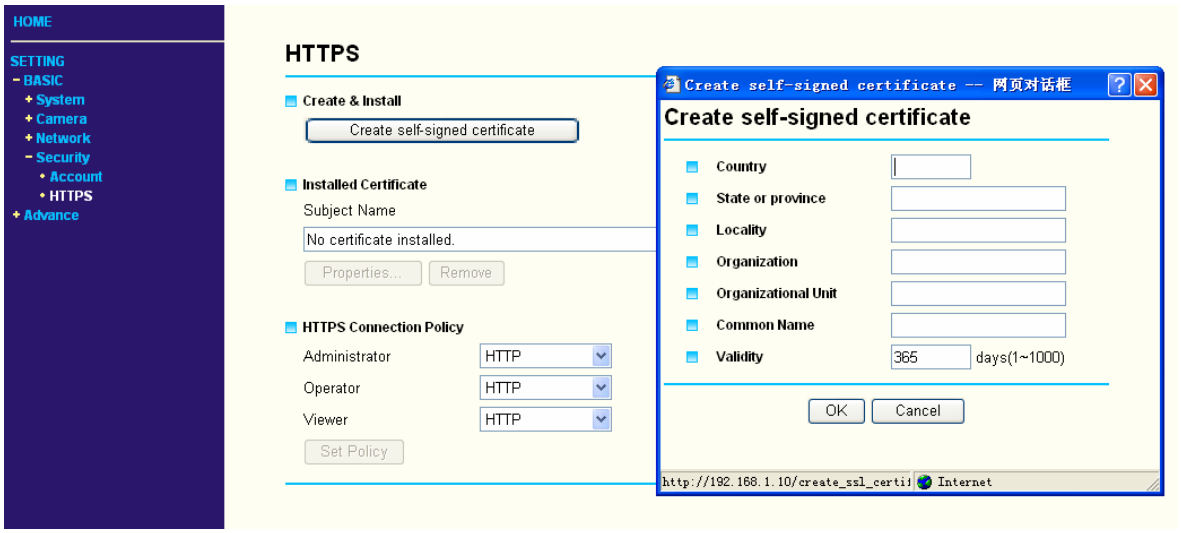
6.4.2 HTTPS

HTTPS is a URL scheme used to indicate a secure HTTP connection. It is syntactically identical to the http:// scheme normally used for accessing resources using HTTP. Using https: //URL/ with a different default TCP port (443) and an additional encryption / authentication layer between the HTTP and TCP, you can use the IP camera through HTTPS easily by using “https://” instead of “http://”.



- **Create & Install**: Create a self-signed certificate for HTTPS to recognize.
- **Installed Certificate**: Display or remove the properties of the installed certificate.
- **HTTPS Connection Policy**: Set HTTPS connection policy for different level of users.

To use the HTTPS encryption, please set up “Create self-signed certificate” for the first time you use the HTTPS function, and then set up the connection policy for different users.



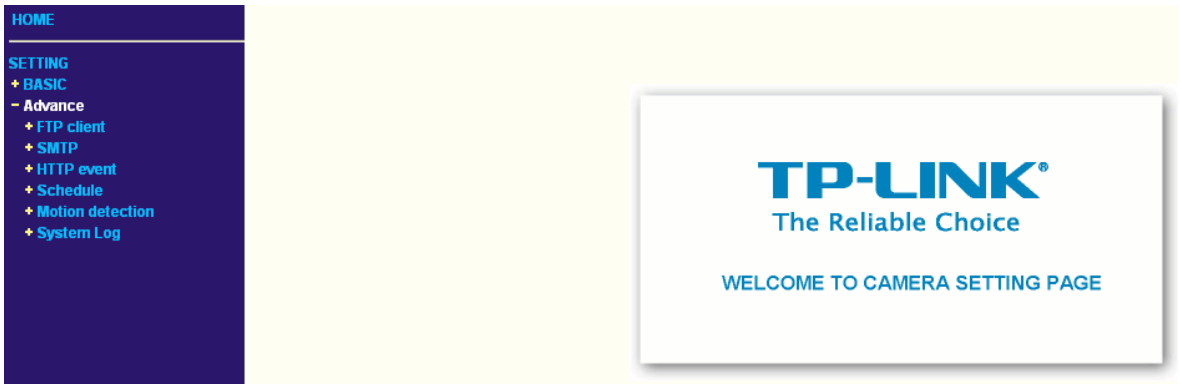
☞ **Note:**

When enable HTTPS with RTSP on mode, the IP Camera only protect the setting such as username and password and do not protect video and audio.

When enable HTTPS with RTSP off mode, the IP Camera will protect all setting including video and audio.

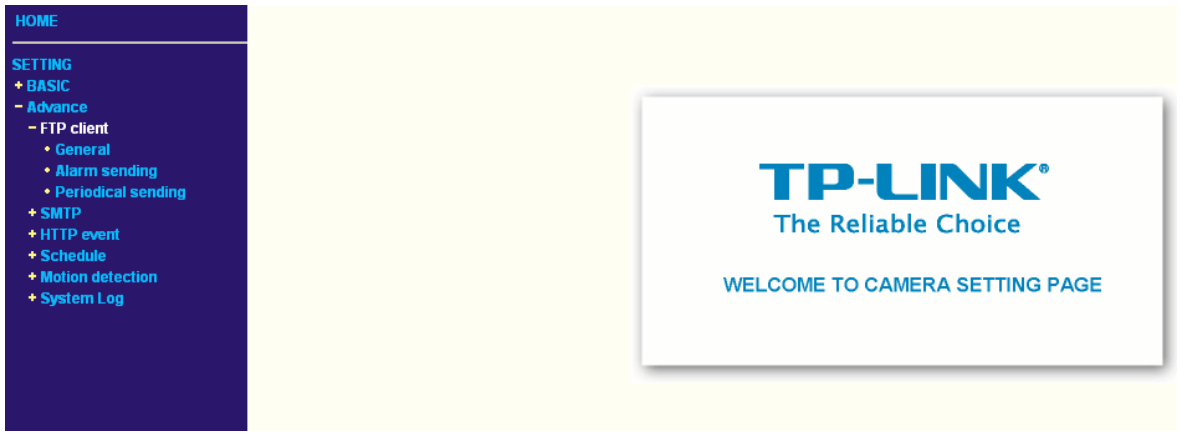
Chapter 7 Setting-Advance

Click **Advance** to display the submenus including **FTP client**, **SMTP**, **HTTP event**, **Schedule**, **Motion detection** and **System Log**.

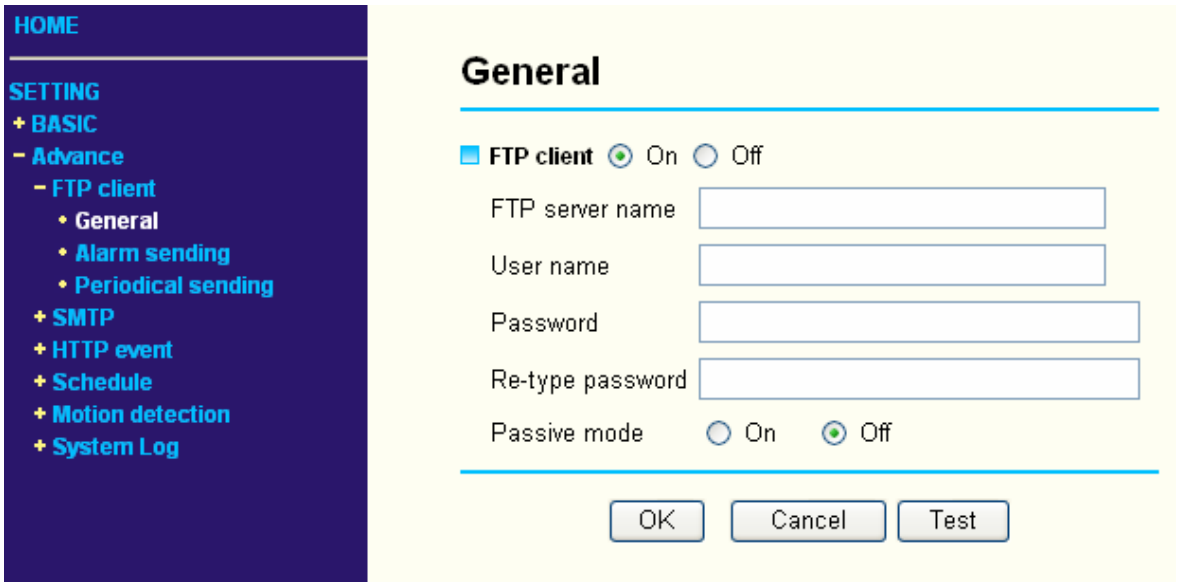


7.1 FTP Client

Use this menu to set up for capturing and sending images to an FTP server. By using FTP client function, you can send the image and video file which has been shot and recorded linked with the built-in motion detection function to FTP server. FTP client setting menu is composed of three items, **General**, **Alarm sending** and **Periodical sending**.



7.1.1 General



Select **On** when you use FTP function. The FTP client setting page will appear.

Select **Off** when you do not wish to use the FTP client function.

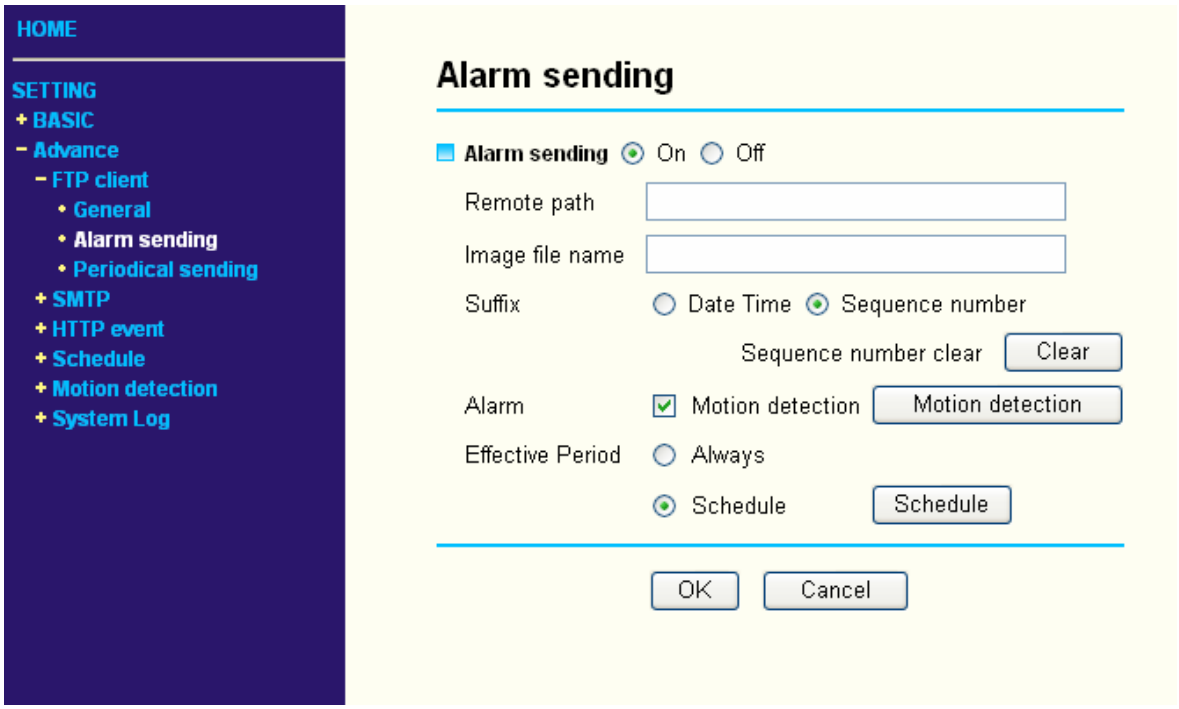
☞ **Note:**

The frame rate and operability on the main viewer may decrease while a file is being transmitted by the FTP client function.

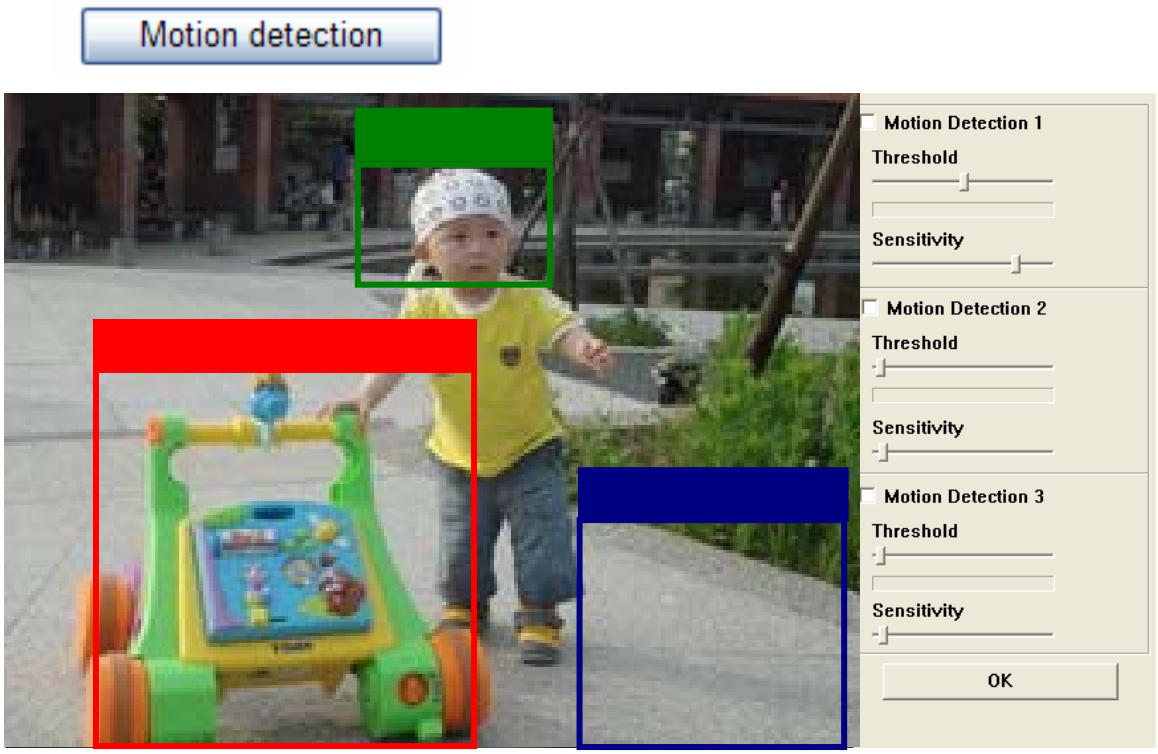
- **FTP server name**: Type the FTP server name to upload still images up to 64 characters, or the IP address of the FTP server.
- **User name**: Type the user name for the FTP server.
- **Password**: Type the password for the FTP server.
- **Retype password**: To confirm the password, type the same characters as you have typed in the Password box.
- **Passive mode**: Set whether you use the passive mode of FTP server or not when connecting to FTP server. Select **On** to connect to FTP server using the passive mode.

7.1.2 Alarm sending

Set to forward the image and video file to the specified FTP server linked with the alarm detection by the built-in motion detection function. Select On to send the image file to FTP server linked with the alarm detection.



- **Remote Path**: Type the path to the destination in FTP server up to 64 characters.
- **Image File Name**: Type the file name you want to assign to the images when sending to the FTP server. You can use up to 10 alphanumeric characters, - (hyphen) and _ (underscore) for naming.
- **Suffix**: Select a suffix to add to the file name
  - **Date & time**: The date & time suffix is added to the Image file name. The date/time suffix consists of lower two-digits of year (2 digits), month (2 digits), date (2 digits), hour (2 digits), minute (2 digits), second (2 digits), and consecutive number (2 digits), thus 14-digit number is added to the file name.
  - **Sequence number**: A consecutive number of 10 digits between 0000000001 and 4294967295 and two fixed digits 00 is added to the Image file name.
  - **Sequence number clear**: Click **Clear** and the suffix of the sequence number returns to 1.
- **Alarm**
  - **Motion Detection**: Click it for using Motion Detection function as a sensor. You can set motion detection function on the **motion detection page**.



☞ **Note:**

You can set motion detection on **motion detection page**. (Please go to "**Setting** → **Advance** →**Motion detection** → **Setting**") For more details, you can check **Section 6.5**.

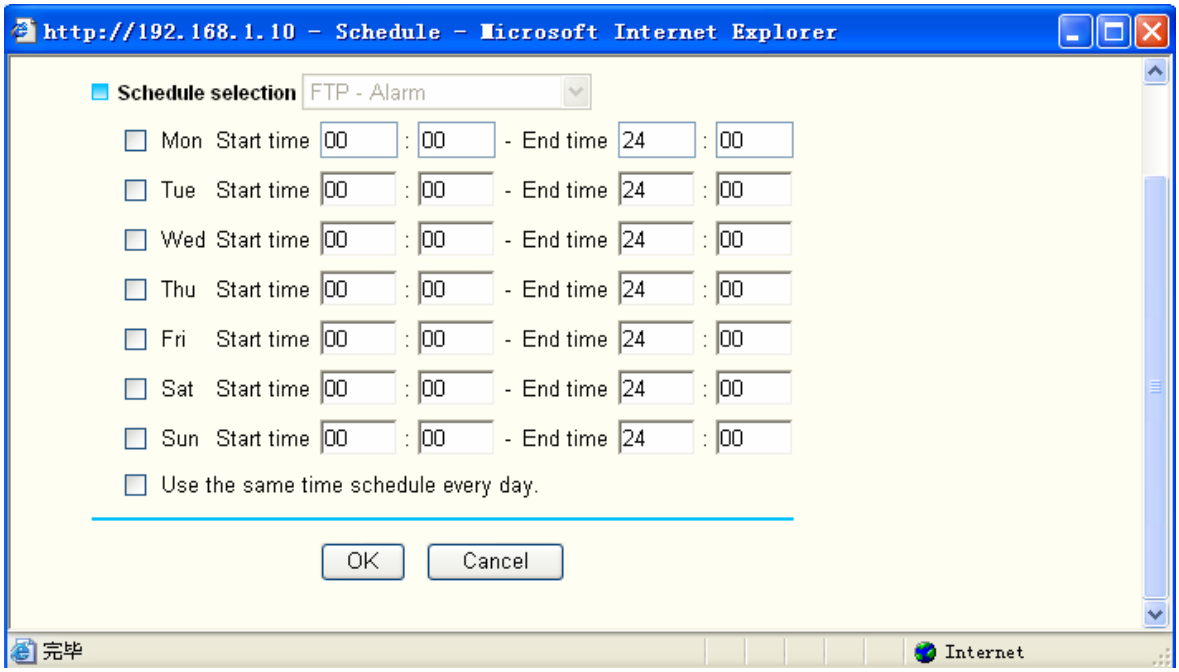
➢ **Effective period**: Set the period when the periodical sending is effective.

- **Always**: The periodical sending is always effective.
- **Schedule**: You can specify the period when the periodical sending is effective in the Schedule setting in the other section.

☞ **Note:**

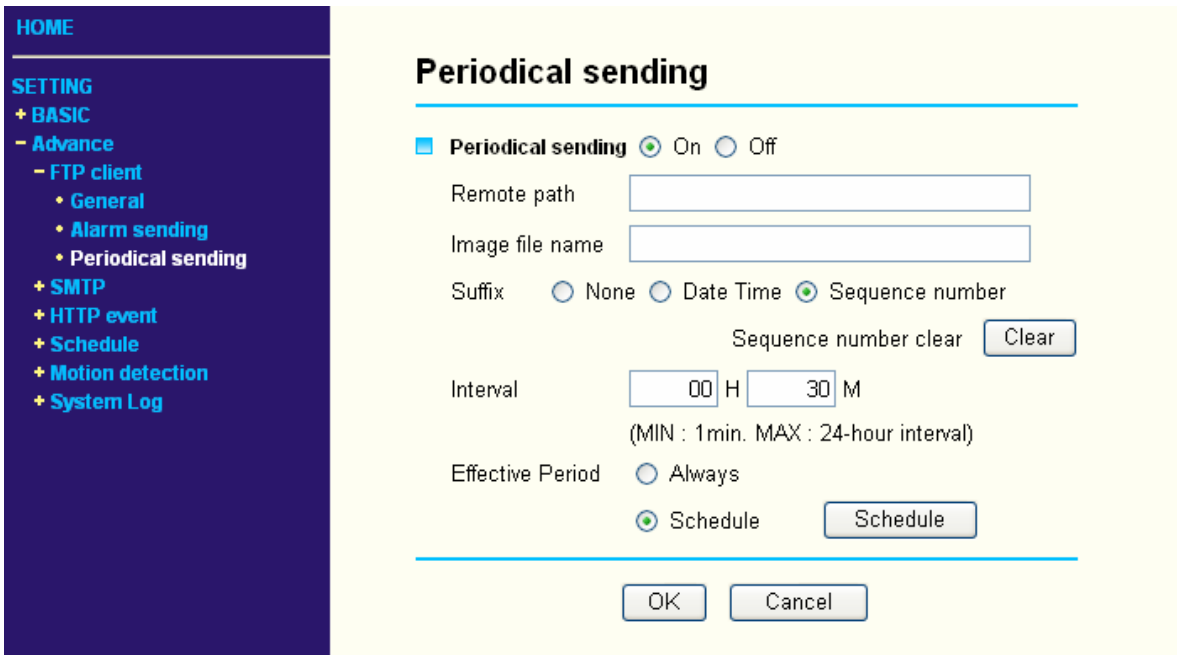
You can set schedule function on **Schedule page**. (Please go to "**Setting** → **Advance** → **Schedule** → **Setting**") For more details, you can check **Section 7.4**.





7.1.3 Periodical sending

You can set to send an image file to FTP server periodically by selecting **On** to send the image file to FTP server linked with setting period.

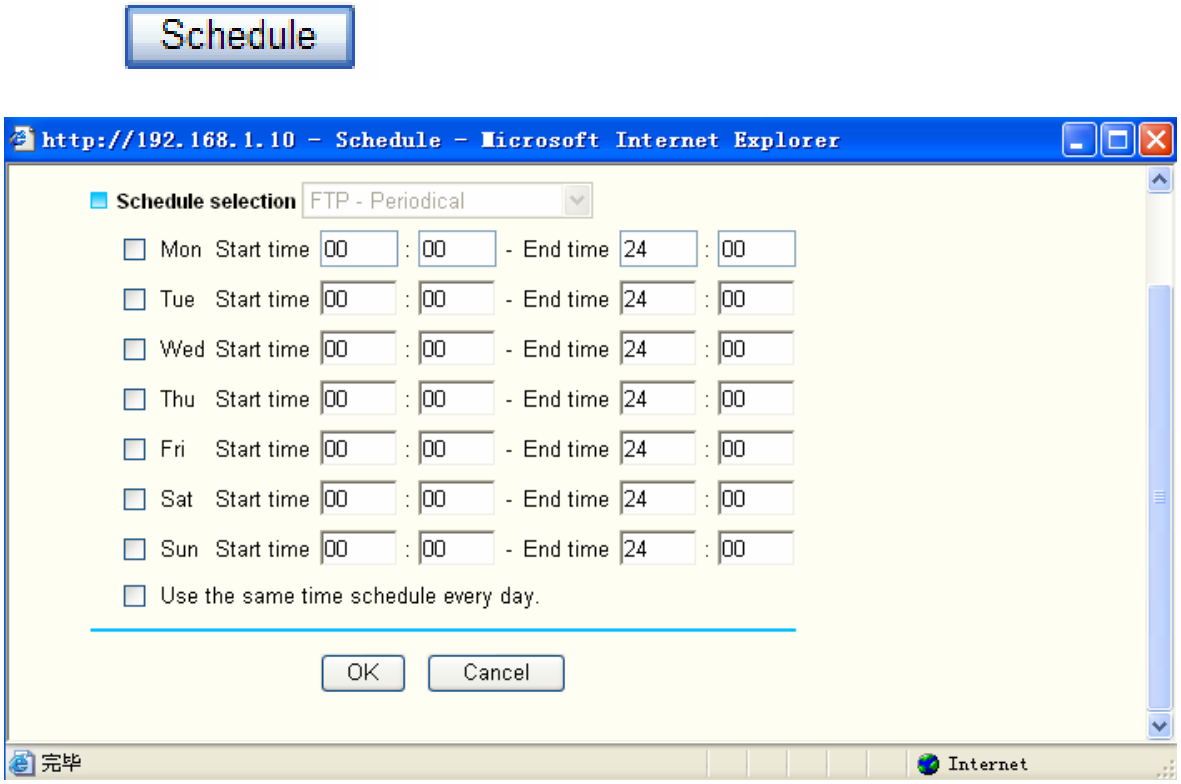


- **Image file name**: Type the file name of the image sent by SMTP up to 10 alphanumeric characters, - (hyphen) and _ (under score).

- **Suffix**: Select a suffix to be added to the file name sent by SMTP.
  - **None**: The name of the sent file will be the Image file name.
  - **Date & time**: The date & time suffix is added to the Image file name. The date & time suffix consists of lower two-digits of year (2 digits), month (2 digits), date (2 digits), hour (2 digits), minute (2 digits) and second (2 digits), and consecutive number (2 digits), thus 14-digit number is added to the file name.
  - **Sequence number**: A consecutive number is added to the Image file name.
  - **Sequence number clear**: Click **Clear** and the suffix of the sequence number returns to 1.
- **Interval**: Set the periodical sending is effective interval. Min value is 1 min and Max value is 24 hour.
- **Effective period**: Set the period when the periodical sending is effective.
  - **Always**: The periodical sending is always effective.
  - **Schedule**: You can specify the period when the periodical sending is effective in the schedule setting in the other section.

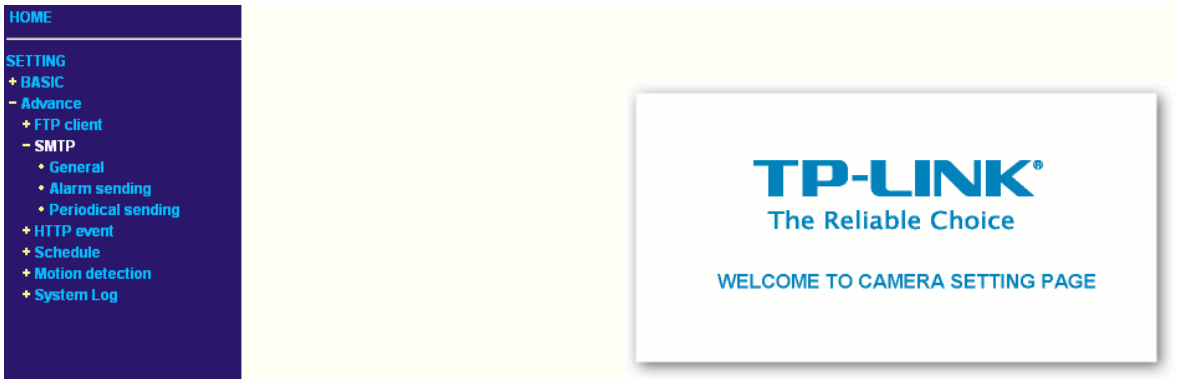
☞ **Note:**

You can set schedule function on **schedule page**. (Please go to "**Setting** → **Advance** → **Schedule** → **Setting**") For more details, you can check **Section 7.4**.



7.2 SMTP

Set the SMTP menu when you want to send an image via e-mail. By using Mail (SMTP) function, you can send a mail with attached image and video which has been shot linked with the built-in motion detection function. The image file can also be sent periodically. E-Mail (SMTP) setting menu is composed of three items, **General**, **Alarm sending** and **Periodical sending**.



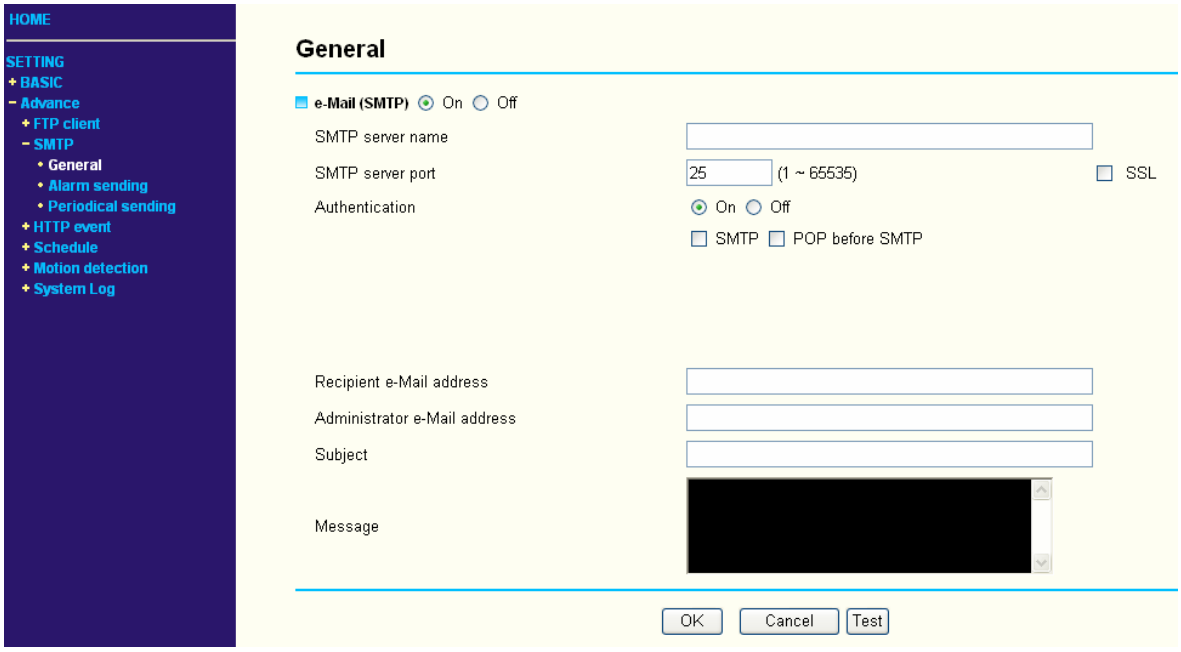
7.2.1 General

Select **On** when you use the SMTP function. The common setting options are displayed below.

Select **Off** if you do not wish to use the e-Mail (SMTP) function.

☞ Note:

The Setting of **General** will be the same as the setting of IP Notification (Please check "**Setting → Basic → Network → IP Notification**")



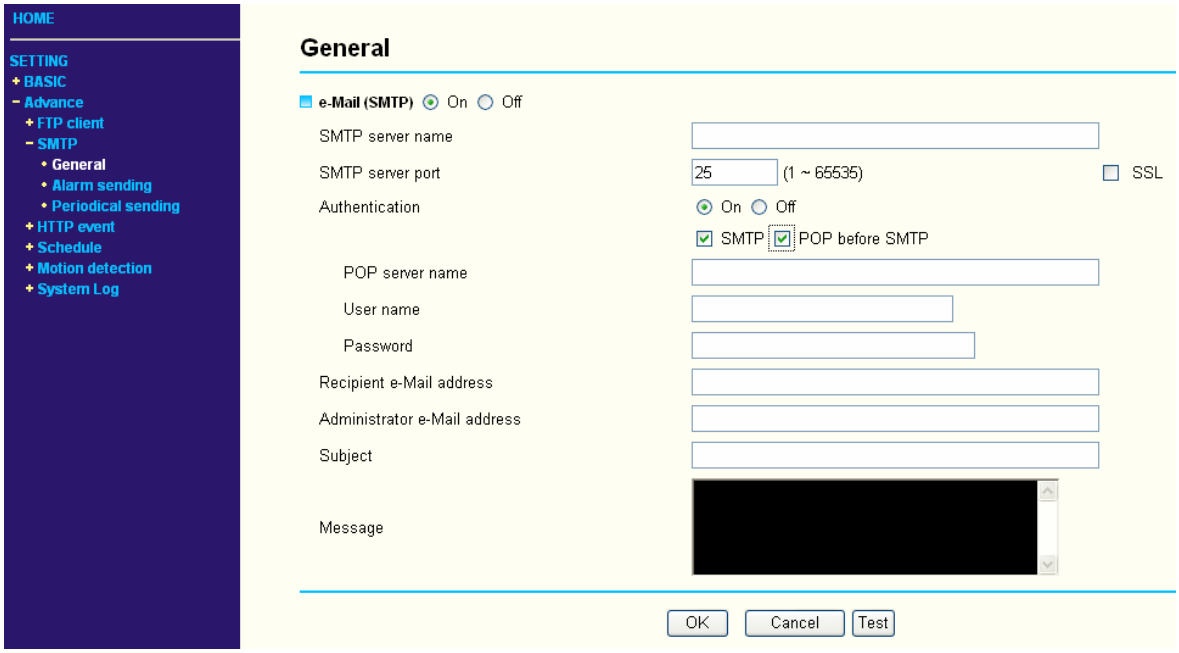
- **SMTP server name**: Type the SMTP server name up to 64 characters, or the IP address of the SMTP server.
- **SMTP Server Port**: You can set port number from 1~65535 according to your mail server. The default value is 25.
- **Security setting**: Check SSL box if the mail server you use has security restriction.

☞ Note:

If you use g-mail as your mail server, you should set 587 as your port number and check SSL box.

➢ **Authentication**: Select the authentication required when you send an email.

- Off: Select it if no authentication is necessary when an email is sent.
- On: When authentication is necessary an e-mail is sent, select one of the authentication methods from the followings.



➢ **SMTP**: Select it if SMTP authentication is necessary when an e-mail is sent.

➢ **POP before SMTP**: Select if POP before SMTP authentication is necessary when an e-mail is sent.

☞ Note:

When you set to On, be sure to select either or both SMTP or / and POP before SMTP.

- **POP server name**: When the **POP before SMTP** is selected in Authentication, type the POP (receiving mail) server name up to 64 characters, or type the IP address of the POP server. This setting is necessary when the SMTP server which sends e-mails performs authentication using the POP user account.
- **User name, Password**: Type the user name and Password of the user who has the mail account. This setting is necessary when the SMTP server which sends e-mails performs authentication.

➢ **Recipient e-mail address**: Type the recipient e-Mail address up to 64 characters. You can specify up to three recipient E-mail addresses.

➢ **Administrator e-mail address**: Type the Administrator e-Mail address up to 64 characters. This address is used for reply mail and sending system messages from the SMTP server.

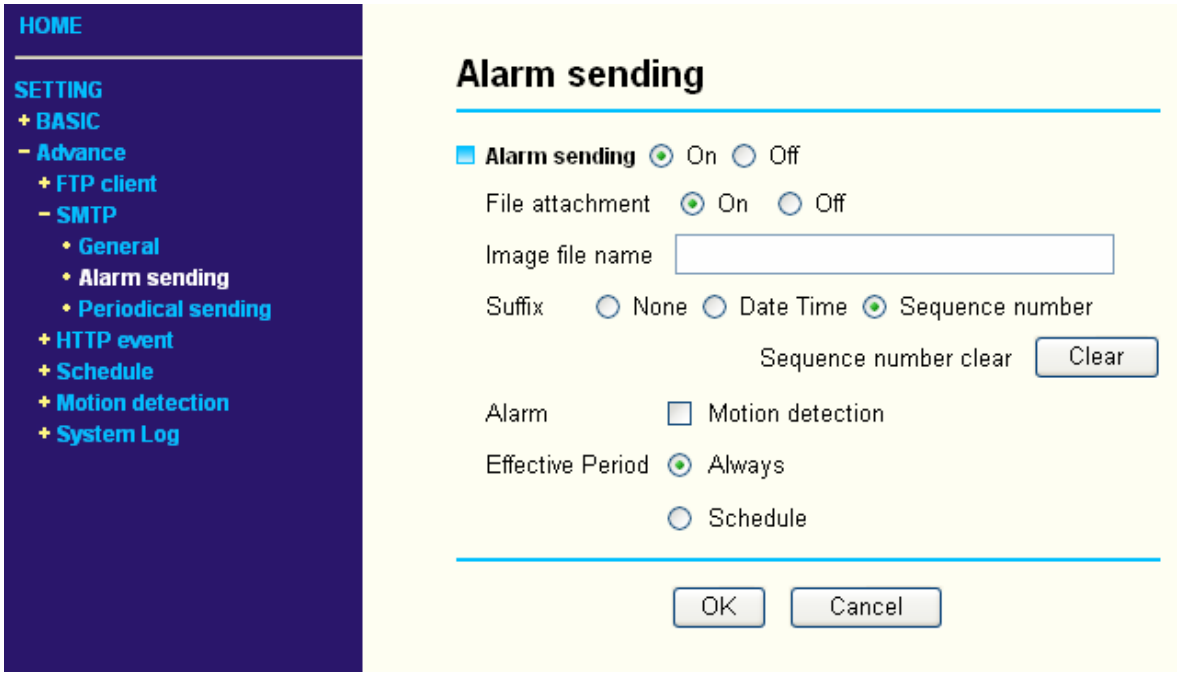
➢ **Subject**: Type the subject/title of the e-Mail up to 64 characters. With respect to mail which is sent according to the alarm detection when Alarm sending of the alarm tab is set to On, the characters standing for the sensor type added to the subject.

➢ **Message**: Type the text of the E-mail up to 384 characters. (A line break is equivalent to 2

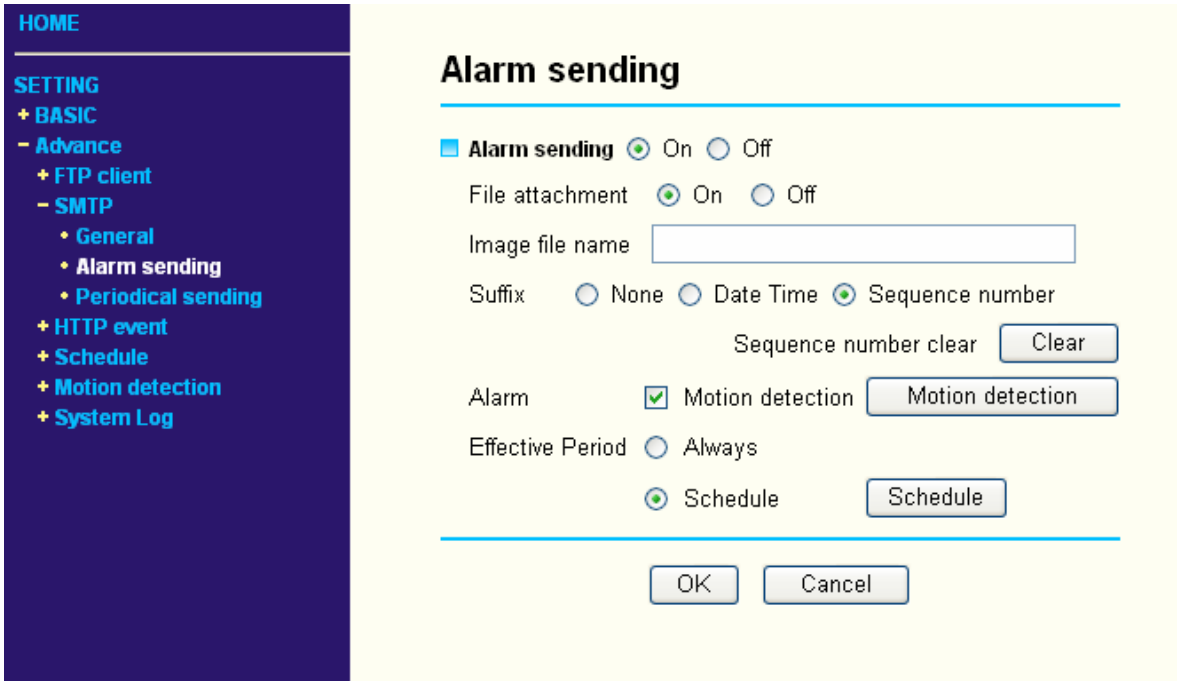
characters.)

7.2.2 Alarm sending

Set to send the mail with connection to the alarm detection by the built-in motion detection function. Select **On** to send the image and file to SMTP server linked with the alarm detection.

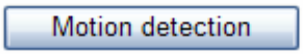


- **Alarm sending**: Select **On** to set to send mail with connection to the alarm detection.
- **File attachment**: Set whether an image file is attached to the mail sent or not. When **On** is selected, the image file made by the settings below is attached. When **Off** is selected, only the message is sent.
- **Image file name**: Type the file name you want to assign to the image to attach a mail. You can use up to 10 alphanumeric, - (hyphen) and _ (underscore) for naming.
- **Suffix**: Select a suffix to add to the file name
  - **Date & time**: The date & time suffix is added to the Image file name. The date/time suffix consists of lower two-digits of year (2 digits), month (2 digits), date (2 digits), hour (2 digits), minute (2 digits), second (2 digits), and consecutive number (2 digits), thus 14-digit number is added to the file name.
  - **Sequence number**: A consecutive number of 10 digits between 0000000001 and 4294967295 and two fixed digits 00 is added to the Image file name.
  - **Sequence number clear**: Click **Clear** and the suffix of the sequence number returns to 1.



➢ **Alarm**

- **Motion Detection**: Click it for using Motion Detection function as a sensor. You can set motion detection function on the **motion detection page**.





☞ **Note:**

You can set motion detection on **motion detection page**. (Please go to "**Setting → Advance → Motion detection → Setting**"). For more details, you can check **Section 7.5**.

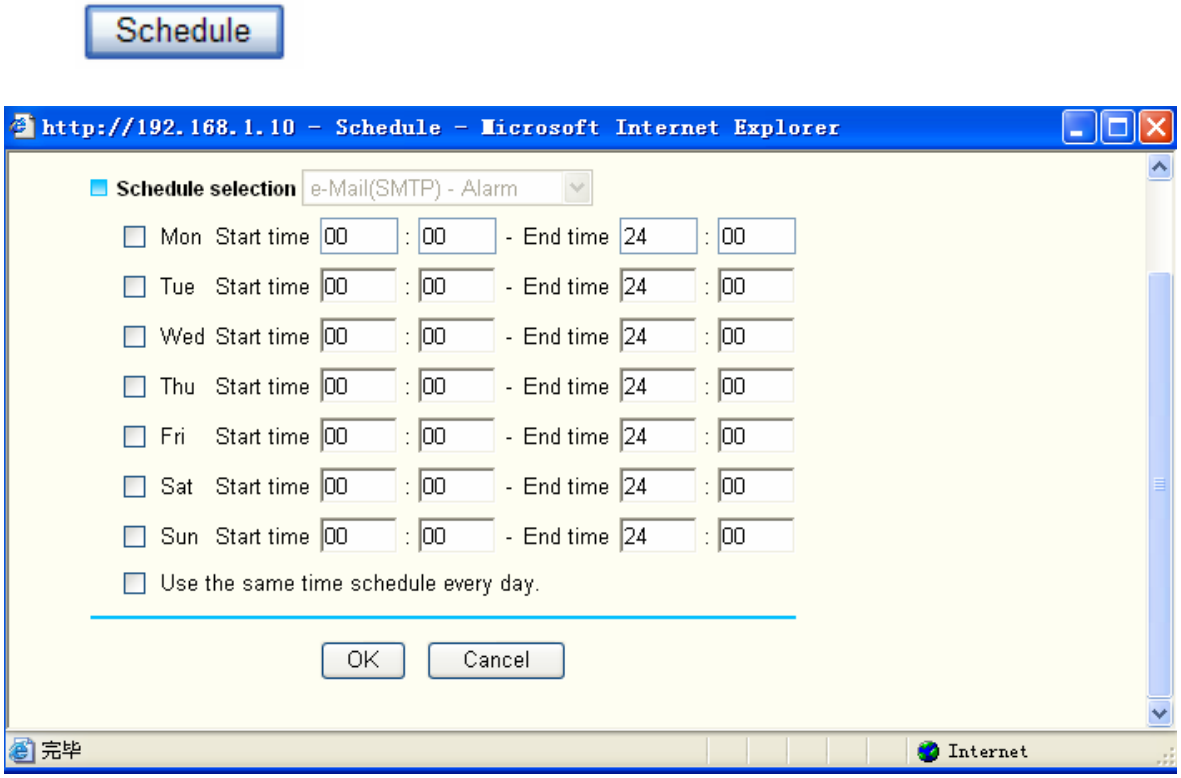
➢ **Effective period**: Set the period when the periodical sending is effective.

- **Always**: The periodical sending is always effective.

- **Schedule**: You can specify the period when the periodical sending is effective in the Schedule setting in the other section.

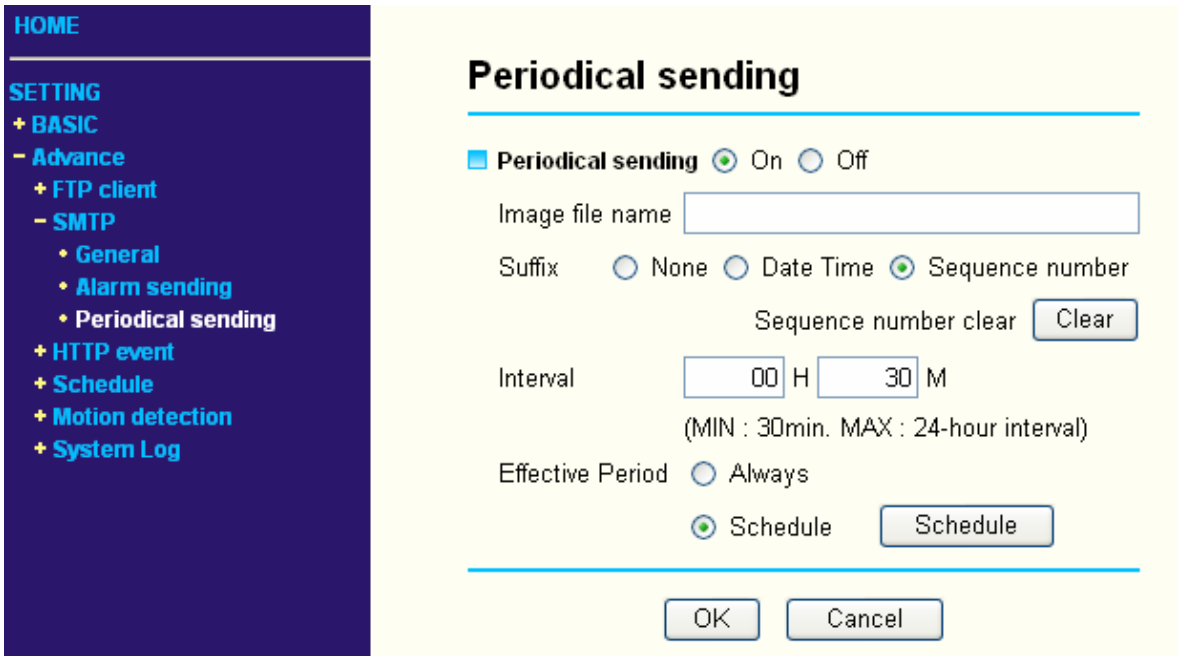
☞ **Note:**

You can set schedule function on **Schedule page**. (Please go to "**Setting → Advance → Schedule → Setting**") For more details, you can check **Section 7.4**.



7.2.3 Periodical sending

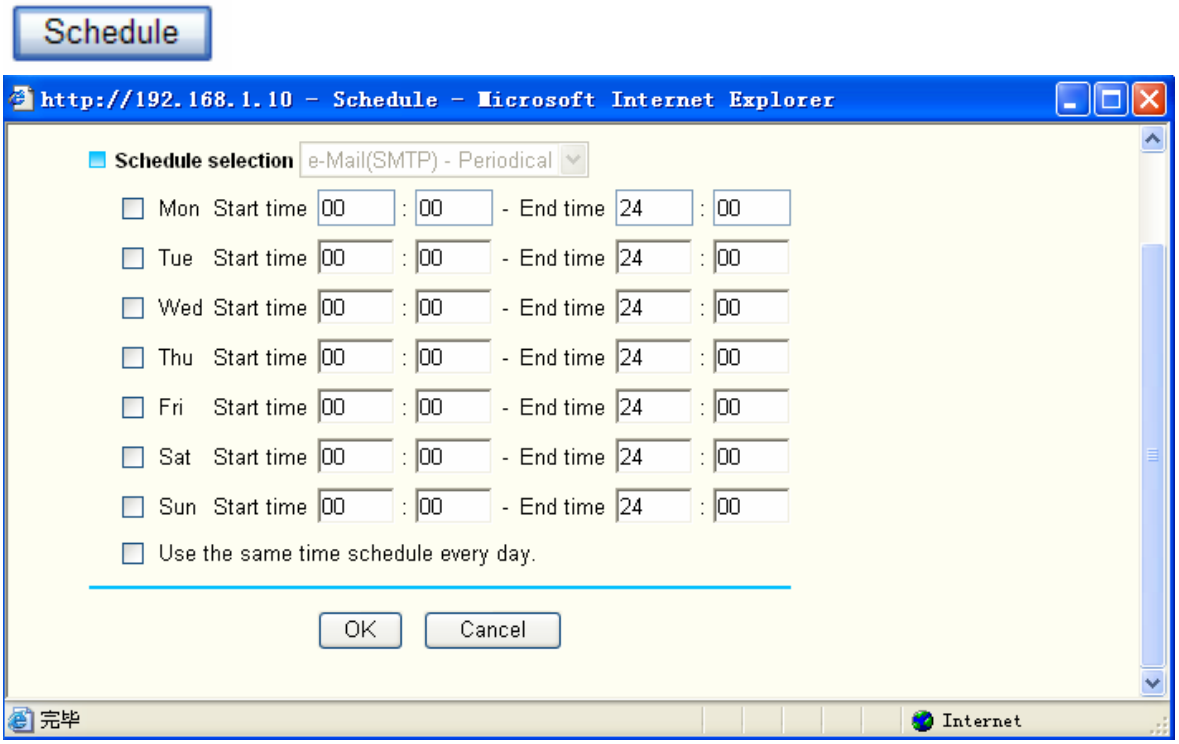
You can set to send an image file by SMTP server periodically by selecting **On** to send the image file by SMTP server linked with setting period.



- **Image file name**: Type the file name of the image sent by SMTP up to 10 alphanumeric characters, - (hyphen) and _ (under score).
- **Suffix**: Select a suffix to be added to the file name sent by SMTP.
  - **None**: The name of the sent file will be the Image file name.
  - **Date & time**: The date & time suffix is added to the Image file name. The date & time suffix consists of lower two-digits of year (2 digits), month (2 digits), date (2 digits), hour (2 digits), minute (2 digits) and second (2 digits), and consecutive number (2 digits), thus 14-digit number is added to the file name.
  - **Sequence number**: A consecutive number is added to the Image file name.
  - **Sequence number clear**: Click **Clear** and the suffix of the sequence number returns to 1.
- **Interval**: Set the periodical sending is effective interval. Minimum value is 30 min and Maximal value is 24 hour.
- **Effective period**: Set the period when the periodical sending is effective.
  - **Always**: The periodical sending is always effective.
  - **Schedule**: You can specify the period when the periodical sending is effective in the schedule setting in the other section. Please check "**Setting → Basic → Advance → Schedule → Setting**."

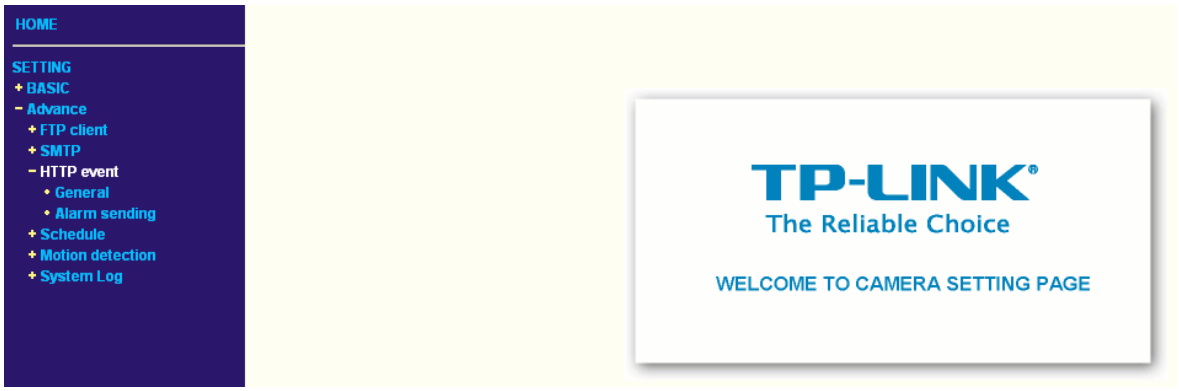
☞ **Note:**

You can set schedule function on **Schedule page**. (Please go to "**Setting → Advance → Schedule → Setting**") For more details, you can check **Section 7.4**.

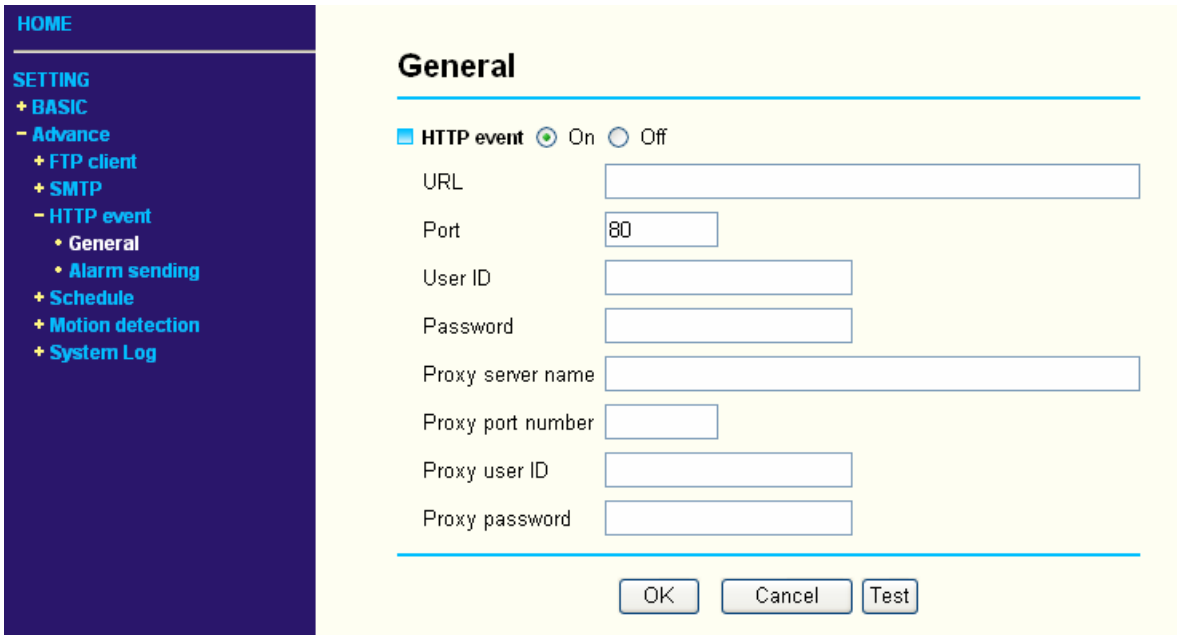


7.3 HTTP event

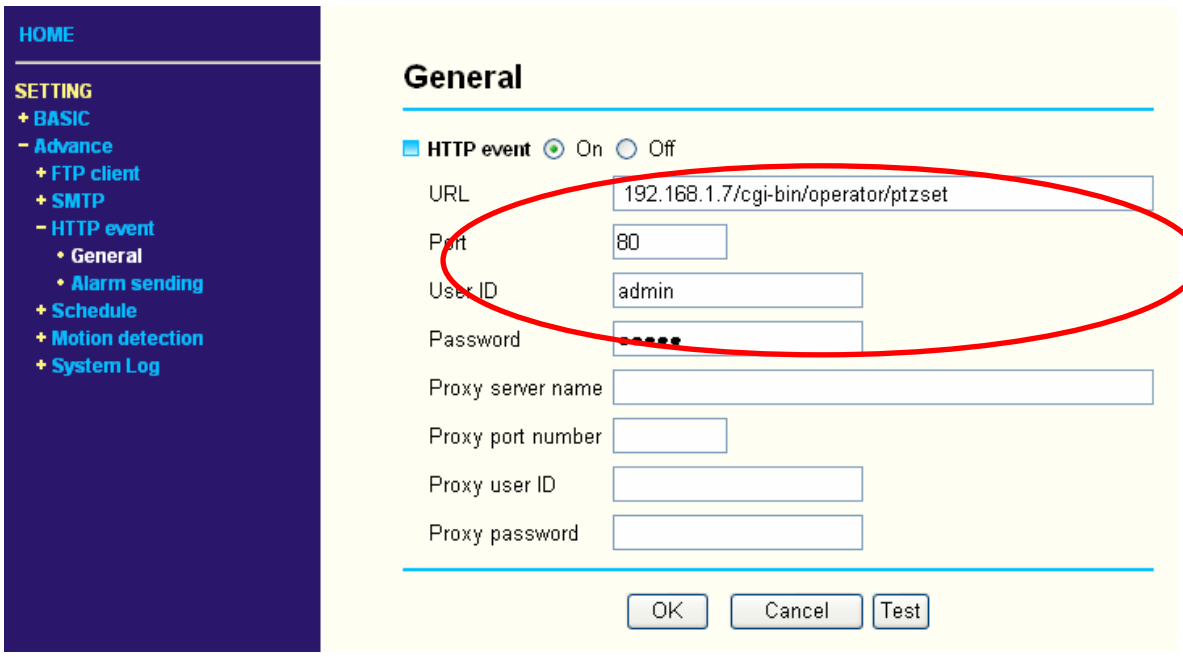
Use this menu to set up for capturing and sending images to an HTTP server. By using HTTP client function, you can send the image file and audio file which has been shot and recorded linked with the built-in motion detection function to HTTP server. HTTP client setting menu is composed of two items, **General** and **Alarm sending**.



7.3.1 General



➢ **HTTP event**: Set up the HTTP server URL, port, User ID, Password, and Proxy Server settings.



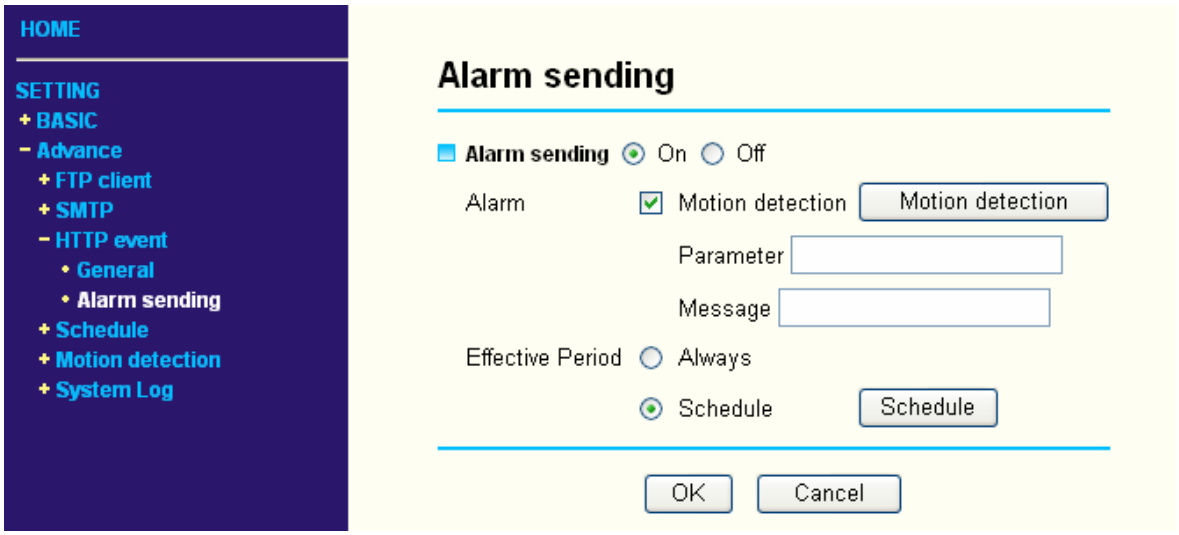
For example: URL: 192.168.1.7/cgi-bin/operator/ptzset

☞ **Note:**

The setting of URL should be the same as CGI

7.3.2 Alarm sending

Set to send the mail with connection to the alarm detection by the built-in motion detection function. Select **On** to send the image and audio file to HTTP server linked with the alarm detection.



Alarm sending: Select **On** to set to send mail with connection to the alarm detection.

- **Alarm**
  - **Motion detection**
- **Effective period**: Set the period when the periodical sending is effective.
  - **Always**: The periodical sending is always effective.
  - **Schedule**: You can specify the period when the periodical sending is effective in the schedule

setting in the other section.

☞ **Note:**

You can set schedule function on **schedule page**. (Please go to "**Setting → Advance → Schedule → Setting**") For more details, you can check **Section 7.4**.

➢ **Alarm**

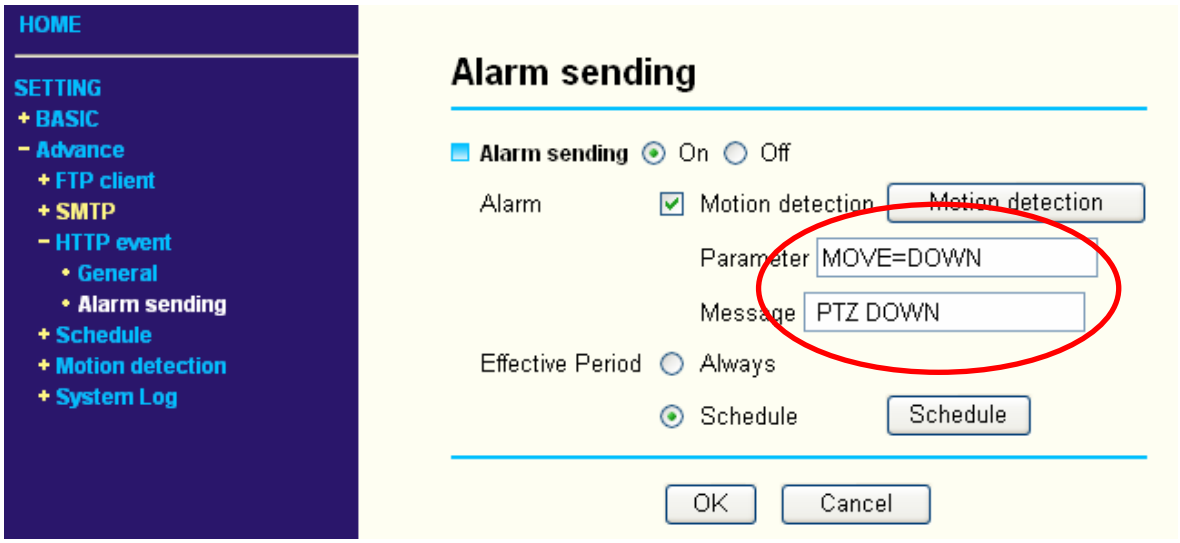
- **Motion Detection**: Click it for using Motion Detection function as a sensor. You can set motion detection function on t**he motion detection function page**.





☞ **Note:**

You can set motion detection on **motion detection page**. (Please go to "**Setting → Advance → Motion detection → Setting**") For more details, you can check **Section 7.5**. Motion Detection works only when the MPEG4 function is On.



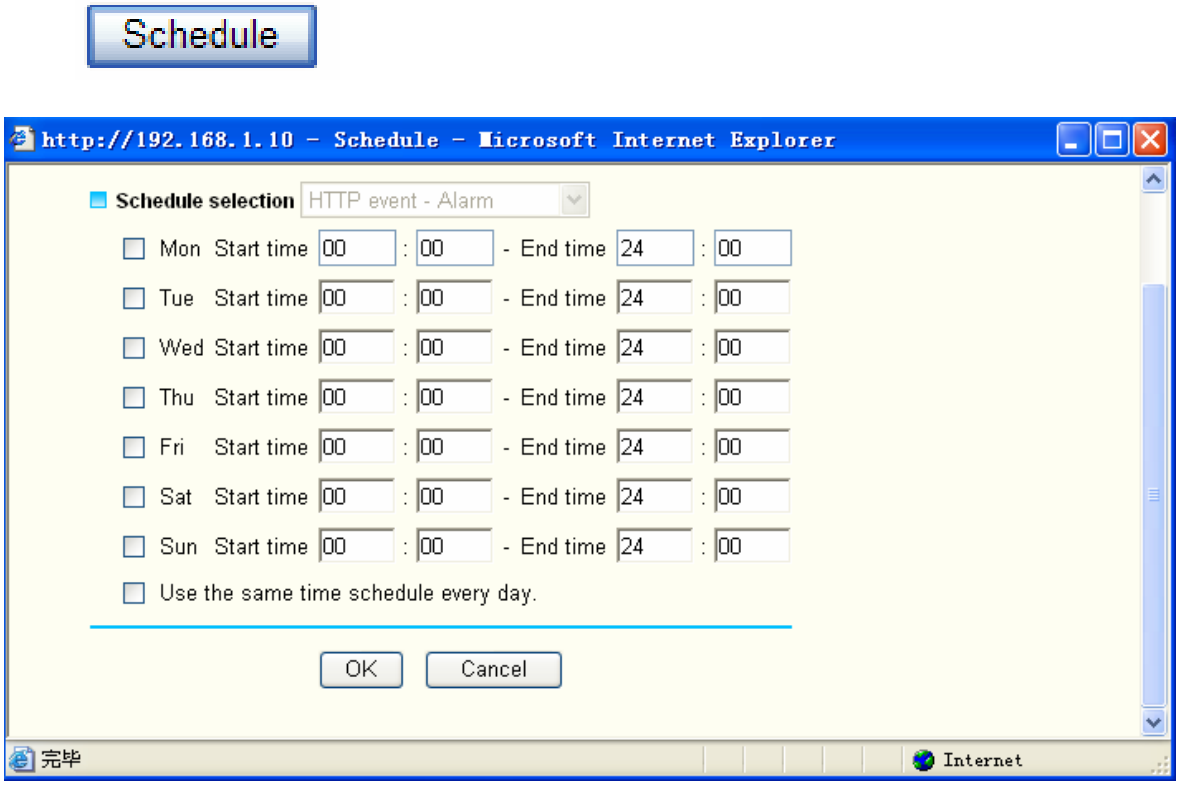
- **Parameter**: the parameter of CGI (defined in **Setting → Advance → HTTP event → General → URL**) is from your target device. For example, move=down.
- **Message**: message will show up in the form of Message = PTZ down. If your target device didn't support the parameter of message, you can't see the message. So you can just take the message as a note. For example: PTZ down.

➢ **Effective period**: Set the period when the periodical sending is effective.

- **Always**: The periodical sending is always effective.
- **Schedule**: You can specify the period when the periodical sending is effective in the Schedule setting in the other section.

☞ **Note:**

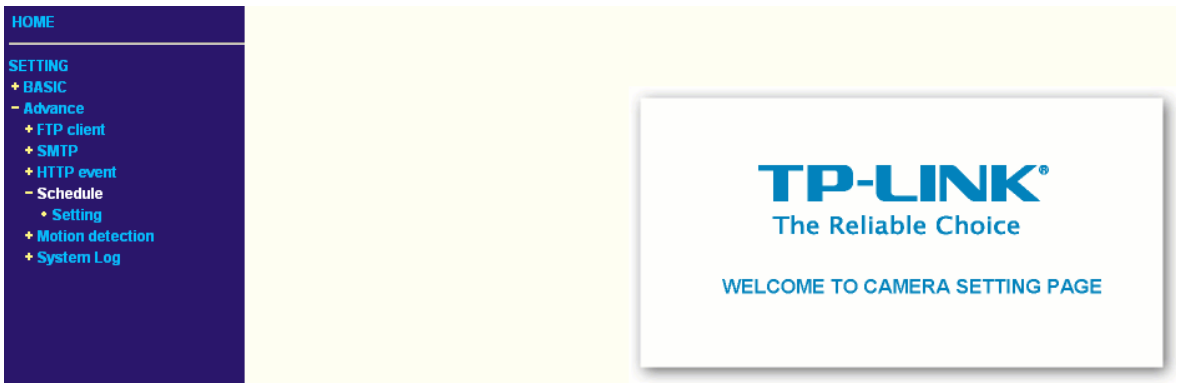
You can set schedule function on **Schedule page**. (Please go to "**Setting → Advance → Schedule → Setting**") For more details, you can check **Section 7.4.**



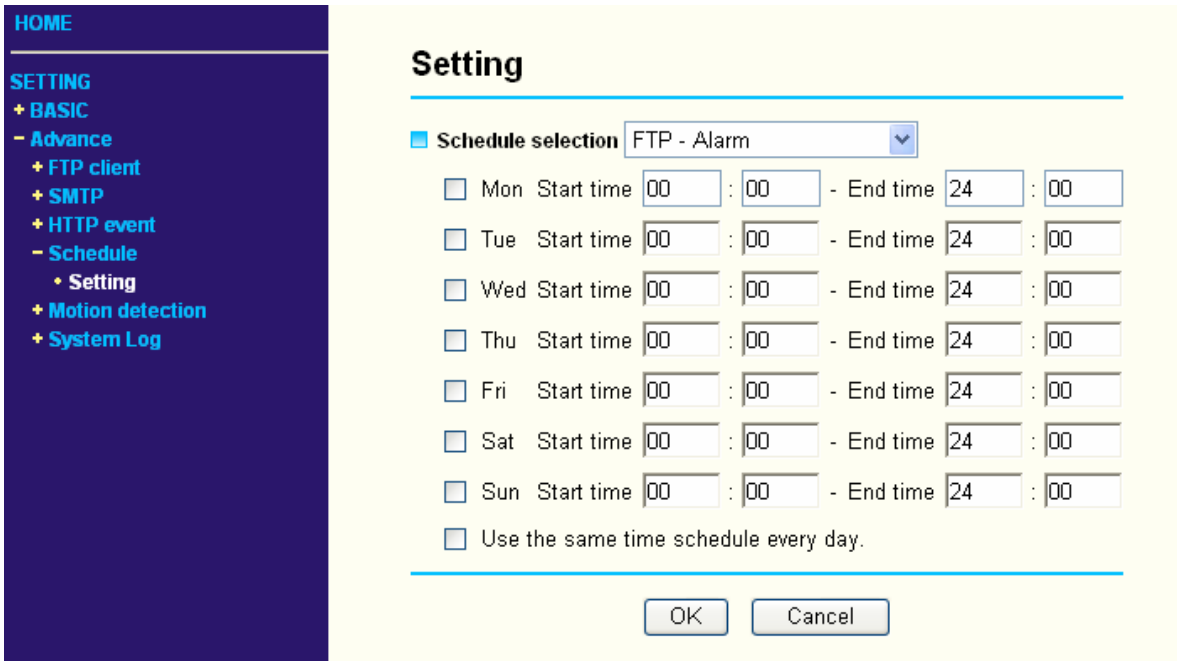
7.4 Schedule

When you click **Schedule** on the **Advance** mode menu, the **Schedule setting** menu appears. This is the same menu as the setting menu which is displayed when you click **Schedule** to set Effective period and **Schedule** in FTP client setting menu, e-Mail (SMTP) setting menu, HTTP Event setting menu and so on.

Example: When setting e-Mail (SMTP) (the alarm sending) in the **Schedule setting** menu.



7.4.1 Setting

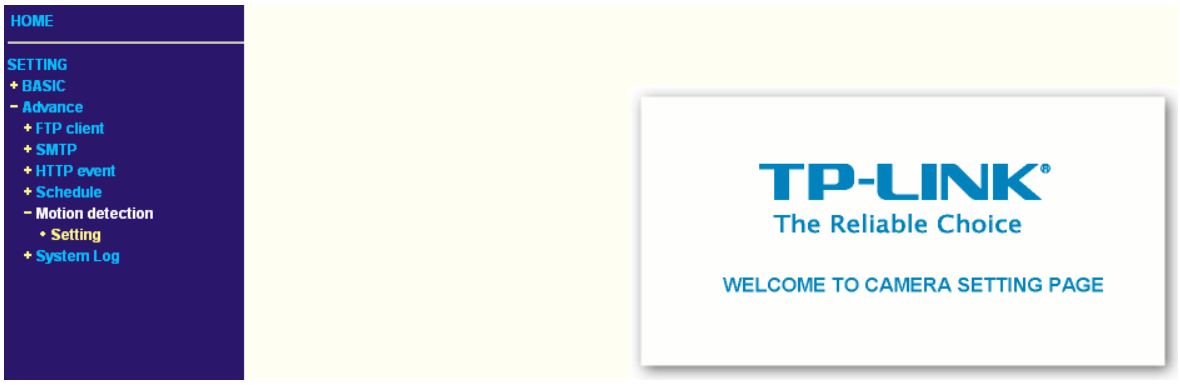


- **Schedule Selection**: Select the list box to specify the schedule you want to set.
  - FTP -Alarm
  - FTP - Periodical
  - e-Mail (SMTP) -Alarm
  - e-Mail (SMTP) -Periodical
  - HTTP event -Alarm
- **Mon (Monday) to Sun (Sunday)**: The time period on the right of the checked day is the effective period of the schedule.
- **Start time, End time:** Specify the Start time and the End time.
- **Use the same time schedule every day**: When this is checked, the Start time and End time set to Mon (Monday) are applied to all days. In this case, the Start time and End time of the other days than Mon (Monday) cannot be input.

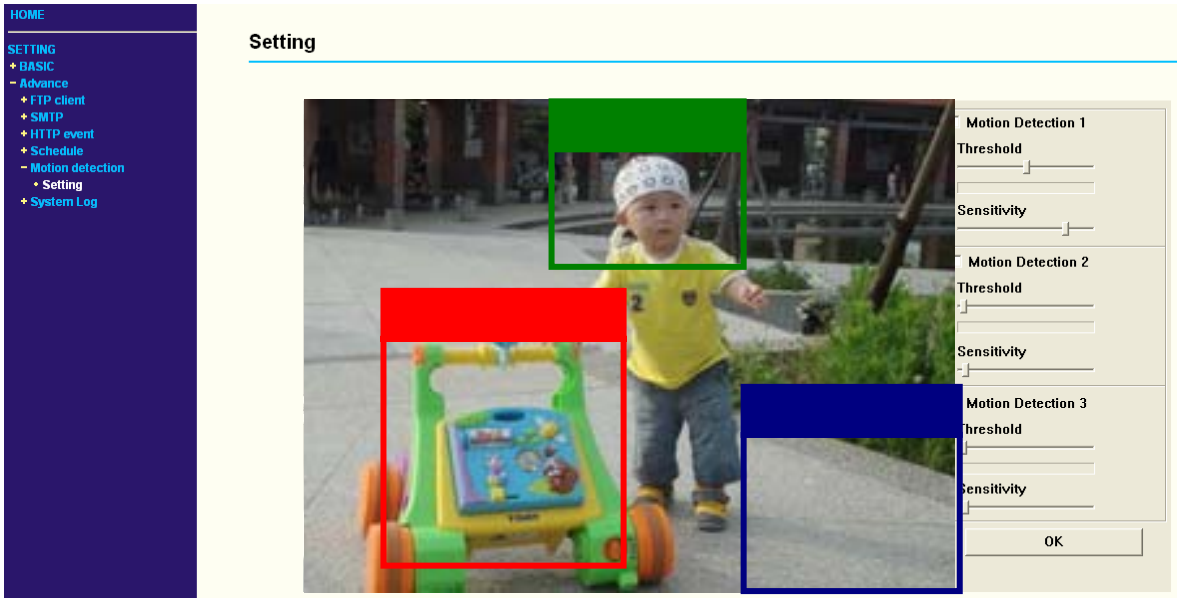
7.5 Motion Detection

There are three Motion Detection functions as sensors to set for different detecting zones. Each one

has Threshold and Sensitivity inputs which you can adjust to specific zone sequentially. Motion Detection function can support FTP, SMTP and HTTP event for capturing and sending images.



7.5.1 Setting



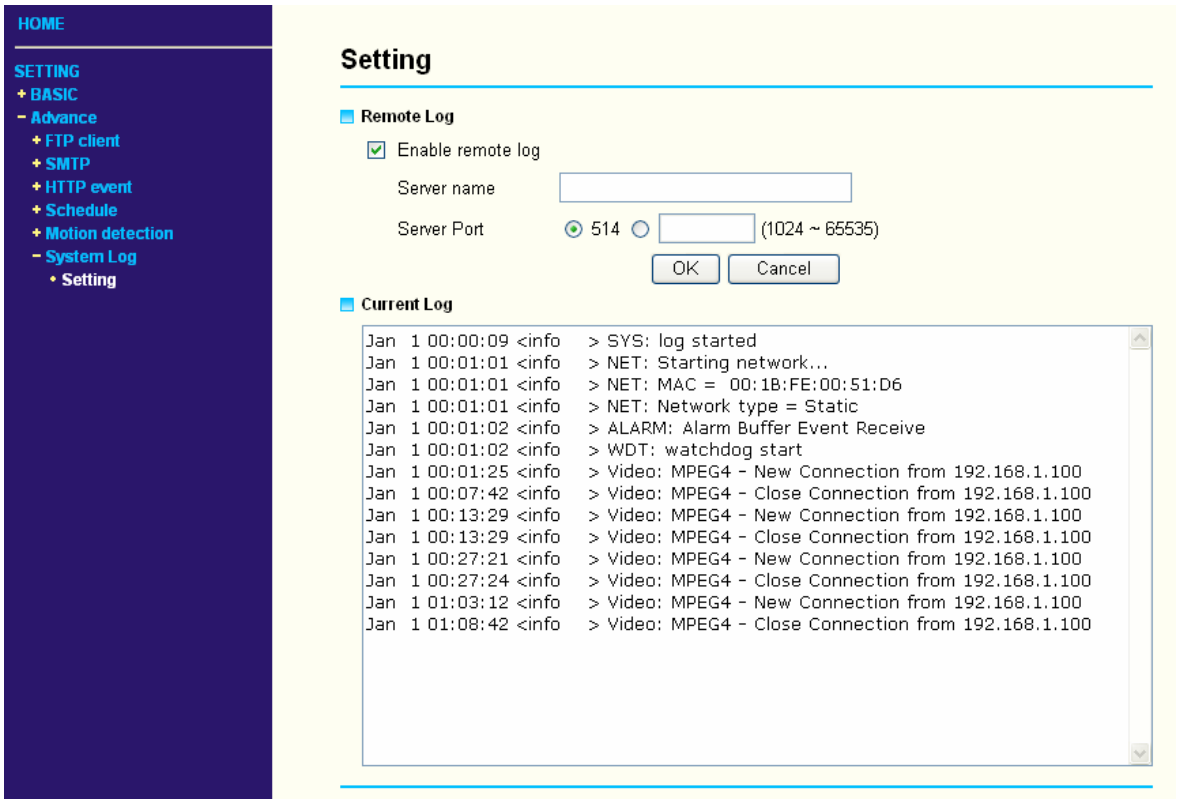
- **Threshold**: It means the extent which the alarm will be triggered.
- **Sensitivity**: It means that how often the sensor will scan the image. The higher sensitivity it is and the more frequently it scans.

  - **Motion Detection 1**: Click it for using **Motion Detection 1** function as a sensor. You can adjust and move the detecting zone by using mouse.
  - **Motion Detection 2**: Click it for using **Motion Detection 2** function as a sensor. You can adjust and move the detecting zone by using mouse.
  - **Motion Detection 3**: Click it for using **Motion Detection 3** function as a sensor. You can adjust and move the detecting zone by using mouse.

7.6 System Log

The System Log function allows users to review any changes and events happened. The system begins logging automatically after started.

7.6.1 Setting



➢ **Enable remote log**: Enables user to send the log data to a specified log server.

☞ Note:

There is a function called Watchdog which can automatically detect errors and restart the IP camera while mpeg, mjepg , 3gpp , or web cannot work. It will take about 5 minutes from detection to reboot, and it will show up with “connecting” on mainpage during this 5 minutes. If the Watchdog function detects errors ,”*** ffmpeg”, ”*** mjpeg”, ”*** gsm” or “*** boa”will be shown in system log. In this case, please send the file ”backup” to TP-LINK (you can save it from Setting > Basic > System > Initialize > Backup setting data) , and also provide the router spec you’re using, we will analyze and solve the problem as soon as possible.

E-mail : support@tp-link.com

Chapter 8 Appendix

APPENDIX A – FRAME RATE & BIT RATE TABLE

This chapter provides tables that help you to optimize your IP camera with your network environment. Base on your network upload environment to choose the best Image-Quality setting.

For example, if the network environment is ADSL 256Kb(upload) / 2Mb(download), the most fluent Image-Quality needs to set up under 256 Kb situation.

A.1 MPEG4 @ 30fps / kbps

Quality	640*480	320*240	160*120
Excellent	**1000**	**300**	**90**
Detailed	**400**	**150**	**50**
Good	**300**	**100**	**30**
Standard	**250**	**70**	**25**
Medium	**250**	**55**	**20**

A.2 MPEG4 / kbps, fps

Image-Size	Bitrate Setting	Frame-Rate Setting	Current Bitrate	Current Frame-Rate
640*480	2048	30	**1800**	**26**
640*480	2048	15	**2200**	**16**
640*480	1536	30	**1500**	**30**
640*480	1536	15	**1700**	**16**
640*480	1024	30	**1000**	**30**
640*480	1024	15	**1000**	**16**
640*480	512	30	**500**	**30**
640*480	512	15	**600**	**16**
320*240	1536	30	**1500**	**30**
320*240	1536	15	**1600**	**16**
320*240	1024	30	**1000**	**30**
320*240	1024	15	**1000**	**16**
320*240	512	30	**550**	**30**

320*240	512	15	**600**	**16**
160*120	1024	30	**950**	**30**
160*120	1024	15	**750**	**16**
160*120	512	30	**500**	**30**
160*120	512	15	**50**	**16**
160*120	128	30	**130**	**30**
160*120	128	15	**140**	**16**

A.3 MJPEG @ 15fps / kbps

Quality	640*480	320*240	160*120
Excellent	**4000**	**1500**	**600**
Detailed	**2400**	**900**	**400**
Good	**1600**	**650**	**300**
Standard	**1300**	**500**	**240**
Medium	**900**	**350**	**170**

A.4 MJPEG / kbps, fps

Image-Size	Quality Setting	Frame-Rate Setting	Current Bitrate	Current Frame-Rate
640*480	Excellent	15	**4000**	**13**
640*480	Excellent	5	**1600**	**5**
640*480	Good	15	**1600**	**13**
640*480	Good	5	**650**	**5**
640*480	Medium	15	**900**	**14**
640*480	Medium	5	**360**	**5**
320*240	Excellent	15	**1500**	**13**
320*240	Excellent	5	**550**	**5**
320*240	Good	15	**650**	**13**
320*240	Good	5	**260**	**5**

320*240	Medium	15	**350**	**13**
160*120	Medium	5	**130**	**5**
160*120	Excellent	15	**600**	**13**
160*120	Excellent	5	**230**	**5**
160*120	Good	15	**300**	**13**
160*120	Good	5	**115**	**5**
160*120	Medium	15	**170**	**13**
160*120	Medium	5	**65**	**5**

APPENDIX B – STORAGE REQUIREMENT TABLE

This chapter provides tables that help you set your recording storage system.

Please refer to the following table to find out the capability for recording into your hard disk.

B.1 MPEG4 Storage Requirement GB / channel / day @ 30fps

Quality	640*480	320*240	160*120
Excellent	**10.5**	**3.2**	**0.9**
Detailed	**4.2**	**1.6**	**0.5**
Good	**3.2**	**1.1**	**0.3**
Standard	**2.6**	**0.7**	**0.3**
Medium	**2.6**	**0.6**	**0.2**

B.2 MPEG4 Storage Requirement GB / channel / day @ 15fps

Quality	640*480	320*240	160*120
Excellent	**5.3**	**1.6**	**0.4**
Detailed	**2.1**	**0.8**	**0.3**
Good	**1.6**	**0.6**	**0.2**
Standard	**1.3**	**0.4**	**0.1**
Medium	**1.3**	**0.3**	**0.1**

B.3 MPEG4 Storage Requirement GB / channel / day

Image-Size	Bitrate Setting	Frame-Rate Setting	Current Bitrate
640*480	2048	30	**23.0**
640*480	2048	15	**22.2**
640*480	1536	30	**18.5**
640*480	1536	15	**17.9**
640*480	1024	30	**10.5**
640*480	1024	15	**10.5**
640*480	512	30	**5.3**
640*480	512	15	**6.3**
320*240	1536	30	**15.8**
320*240	1536	15	**16.9**
320*240	1024	30	**10.5**
320*240	1024	15	**10.5**
320*240	512	30	**5.8**
320*240	512	15	**6.3**
160*120	1024	30	**10.0**
160*120	1024	15	**7.9**
160*120	512	30	**5.3**
160*120	512	15	**0.5**
160*120	128	30	**1.4**
160*120	128	15	**1.5**